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ABSTRACT

The "Education Statistics Quarterly" gives a comprehensive overview of work done across all parts of the National Center for Education Statistics (NCES). Each issue contains short publications, summaries, and descriptions that cover all NCES publications and data products released during a 3-month period. Each message also contains a message from the NCES on a timely topic and a featured topic with invited commentary. This issue contains: (1) "Projections of Education Statistics to 2010" (Debra E. Gerald and William J. Hussar); (2) "Invited Commentary: The Baby Boom Echo Goes to College--By the Millions" (Richard W. Riley); (3) "Invited Commentary: Meeting Greater Expectations and Greater Needs for Education Data" (Lavan Dukes and Edward Croft); (4) "Children Who Enter Kindergarten Late or Repeat Kindergarten: Their Characteristics and Later School Performance" (Jerry West, Anne Meek, and David Hurst); (5) "High School Dropouts, by Race/Ethnicity and Recency of Migration" ("The Condition of Education"); (6) "Teacher Supply in the United States: Sources of Newly Hired Teachers in Public and Private Schools: 1987-88 to 1993-94" (Stephen P. Broughman and Mary R. Rollefson); (7) "Salaries of Teachers" ("The Condition of Education"); (8) "In the Middle: Characteristics of Public Schools with a Focus on Middle Schools" (Martha Naomi Alt and Susan P. Choy); (9) "Condition of America's Public School Facilities: 1999" (Laurie Lewis, Kyle Snow, Elizabeth Farris, Becky Smerdon, Stephanie Cronen, and Jessica Kaplan); (10) "Characteristics of the 100 Largest Public Elementary and Secondary School Districts in the United States: 1998-1999" (Beth Aronstamm Young); (11) "Postsecondary Students with Disabilities: Enrollment, Services, and Persistence" (David Hurst, Ed. and Becky Smerdon, Ed.); (12) "Entry and Persistence of Women and Minorities in College, Science and Engineering Education" (Gary Huang, Nebiyu Taddese, and Elizabeth Walter); (13) "Debt Burden Four Years after College" (Susan P. Choy); (14) "College Quality and the Earnings of Recent College Graduates" (Robert A. Fitzgerald); (15) "Public Libraries in the United States: FY 1997" (Adrienne Chute and P. Elaine Kroe); (16) "Educational Attainment" ("The Condition of Education"); (17) "The Condition of Education: 2000" (National Center for Education

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Statistics); (18) "Quality Profile for SASS Rounds 1-3: 1987-1995" (Graham Kalton, Marianne Winglee, Sheila Krawchuk, and Daniel Levine); (19) "How Does NAEP Select Schools and Students?" (Alan Vanneman and Sheida White); and (20) "How Does NAEP Ensure Consistency in Scoring?" (Sheida White, Connie Smith, and Alan Vanneman). Each article contains references. (Contains 20 tables and 19 figures.) (SLD)

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The NCES Web Site provides information about NCES, as well as access to a wide range of publications and data sets about education in the United States and other nations.

Reach NCES staff

Each article in the *Quarterly* lists the name and e-mail address of the NCES staff member who can answer questions about the content. It is also easy to contact any member of the NCES staff from the NCES Home Page. Under "NCES Quick Links," select "NCES Staff Directory," then click on the first letter of the person's last name.

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Editorial Note

National Center for Education Statistics

The National Center for Education Statistics (NCES) fulfills a congressional mandate to collect and report "statistics and information showing the condition and progress of education in the United States and other nations in order to promote and accelerate the improvement of American education."

Education Statistics Quarterly

Purpose and goals

At NCES, we are convinced that good data lead to good decisions about education. The *Education Statistics Quarterly* is part of an overall effort to make reliable data more accessible. Goals include providing a quick way to

- identify information of interest;
- review key facts, figures, and summary information; and
- obtain references to detailed data and analyses.

Content

The *Quarterly* gives a comprehensive overview of work done across all parts of NCES. Each issue includes short publications, summaries, and descriptions that cover all NCES publications and data products released during a 3-month period. To further stimulate ideas and discussion, each issue also incorporates

- a message from NCES on an important and timely subject in education statistics; and
- a featured topic of enduring importance with invited commentary.

A complete annual index of NCES publications will appear in the Winter issue (published each January). Publications in the *Quarterly* have been technically reviewed for content and statistical accuracy.

General note about the data and interpretations

Many NCES publications present data that are based on representative samples and thus are subject to sampling variability. In these cases, tests for statistical significance take both the study design and the number of comparisons into account. NCES publications only discuss differences that are significant at the 95 percent confidence level or higher. Because of variations in study design, differences of roughly the same magnitude can be statistically significant in some cases but not in others. In addition, results from surveys are subject to nonsampling errors. In the design, conduct, and data processing of NCES surveys, efforts are made to minimize the effects of nonsampling errors, such as item nonresponse, measurement error, data processing error, and other systematic error.

For complete technical details about data and methodology, including sample sizes, response rates, and other indicators of survey quality, we encourage readers to examine the detailed reports referenced in each article.

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Note From the Acting Commissioner

Gary W. Phillips

As the primary federal agency responsible for providing data on the condition of education in the United States, the National Center for Education Statistics (NCES) conducts and reports on numerous data collections and studies. The information generated covers a wide range of topics encompassing all levels of education, from preprimary programs to graduate study and lifetime learning. This information is available at various levels of aggregation, ranging from the national to the institutional, and in a wide variety of formats. In addition to ordering print or CD-ROM versions, users can now access most reports and data sets from the NCES Web Site. NCES is constantly striving to improve the quality, timeliness, relevance, and accessibility of education statistics.

NCES Data Are Used by Policymakers, Researchers, and Others

Objective, high-quality statistics are crucial for informed decision making about education—whether at the national, state, local, institutional, or family level. Part of the audience for NCES data and publications consists of members of the education research and policy communities. These users include policymakers and researchers at all levels of government, in education organizations and advocacy groups, and in a variety of postsecondary institutions and research-oriented organizations. NCES information is also published by the news media and used by parents, teachers, and other members of the general public.

By maintaining close contacts with users, NCES tries to ensure that it collects and communicates the statistics needed to inform policy decisions and stimulate research. Formal mechanisms for obtaining user input include broadly representative survey review panels and data cooperatives, as well as user satisfaction questionnaires. However, because NCES has the goal of providing unbiased information that can be used by everyone, users do not usually have an opportunity to express their viewpoints in NCES publications. The *Education Statistics Quarterly* provides a unique forum for various expert users to share their opinions with others who use NCES information.

In Each *Quarterly* Issue, Users Express Their Opinions in Two Independent Commentaries

Each issue of the *Education Statistics Quarterly* includes two invited commentaries by respected experts in the education research and policy communities. These independent perspectives on policy and data issues are intended to stimulate ideas and discussion in the field of education statistics. Since publication of the first issue in spring 1999, the *Quarterly* has offered commentaries about NCES reports on the following featured topics:

- *Teacher Quality* (spring 1999)
- *Instructional Practices* (summer 1999)
- *Life After College* (fall 1999)
- *Civics Achievement* (winter 1999)
- *America's Kindergartners* (spring 2000)
- *The Common Core of Data* (summer 2000)

Policy commentaries

In each issue, the first of the two invited commentaries typically focuses on important policy implications of an NCES data set. In the fall 1999 issue (volume 1, issue 3), for example, Peter Syverson of the Council of Graduate Schools explores the implications of data from the Baccalaureate and Beyond Longitudinal Study (B&B:1993/1997) indicating the emergence of a " 'new majority' of working adults involved in graduate . . . education," which "requires a set of services . . . quite different from those required for the traditional graduate student." In the current issue of the *Quarterly*, the first commentary presents the viewpoints of U.S. Secretary of Education Richard W. Riley on policy issues related to NCES projections of education statistics.

Data commentaries

The second commentary generally focuses more on data and measurement issues, including strengths and limitations of the data currently available, as well as actual or desirable plans for future surveys or analyses. In the winter 1999 issue (volume 1, issue 4), for example, Richard Niemi of the University of Rochester explores a number of issues related to data from the National Assessment of Educational Progress (NAEP) 1998 Civics Assessment, including the extent to which these data can and cannot be used to answer several common questions about the past and present civics performance and abilities of students in the United States. In the current issue of the *Quarterly*, Lavan Dukes and Edward Croft of the Florida Department of Education discuss why projections of education statistics are important and how states contribute to and benefit from good projections data.

Future issues of the *Quarterly* will continue to provide independent commentaries on education statistics topics of enduring importance. If you have ideas for interesting topics or commentators, we would like to hear about them. In addition, we would like to hear what you think about the general utility of this type of commentary. Please direct your comments to the *Quarterly* Editorial Board at the following address:

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Featured Topic: Projections of Education Statistics

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Projections of Education Statistics to 2010

Debra E. Gerald and William J. Hussar

This article was excerpted from the Compendium report of the same name. The sample survey and universe data are from many sources, both government and private, which are listed at the end of this article.

Introduction

Projections of Education Statistics to 2010 is the 29th report in a series begun in 1964. This report provides revisions and extensions of projections shown in *Projections of Education Statistics to 2009* and includes statistics on elementary and secondary schools and institutions of higher education at the national level. For the nation, the report contains data on enrollment, teachers, graduates, and expenditures for the past 14 years and projections to the year 2010. In addition, the report includes projections of public elementary and secondary school enrollment and public high school graduates to the year 2010 at the state level. These projections were produced by the National Center for Education Statistics (NCES) to provide researchers, policy analysts, and others with state-level projections developed using a consistent methodology.

Methodology

The NCES projections presented in this report reflect revisions to the intercensal estimates based on the unadjusted 1990 census data.* The U.S. Census Bureau's population projections also reflect the incorporation of the 1999 estimates and latest assumptions for the fertility rate, net immigration, and mortality rate.

As detailed in the full report's technical appendixes, assumptions regarding the population and the economy are the key factors underlying the projections of education statistics. Because projections of time series depend on the validity of many assumptions, these projections are uncertain and usually differ from the final reported data. Therefore, this report includes three alternative projections for most of the statistical series. These alternative projections are based on different assumptions about growth paths. Although the first alternative set of projections (middle alternative) is deemed to represent the most likely projections, the low and high alternatives provide a reasonable range of outcomes.

*The intercensal estimates do not include the net undercount of 4 to 5 million.

Report structure

The report contains seven chapters, each consisting of a summary essay followed by a number of figures and tables:

Chapter title	Chapter includes: State-level projections?	Chapter includes: Alternative projections?
Elementary and Secondary Enrollment	Yes (for public schools)	
Higher Education Enrollment		Yes
High School Graduates	Yes (for public schools)	
Earned Degrees Conferred		
Elementary and Secondary Teachers		Yes
Expenditures of Public Elementary and Secondary Schools		Yes
Expenditures of Institutions of Higher Education		Yes

This article presents key statistics from each chapter.

Elementary and Secondary Enrollment

Total public and private elementary and secondary enrollment is projected to increase 1 percent from 1998 to 2010. The primary reason for the continuing increase is the rising number of annual births between 1977 and 1990—sometimes referred to as the baby boom echo. After a period of stability and small declines from 1991 to 1997, the number of births has begun rising again.

Total public and private elementary and secondary enrollment is projected to increase from 52.5 million in 1998 to 53.5 million in 2005 (table A), an increase of 2 percent. Then total enrollment is projected to decrease by 1 percent (to 53.0 million) by 2010, resulting in an overall increase of 1 percent from 1998.

Enrollment by grade level

Enrollment in grades K–8 has increased from 34.0 million in 1990 to a projected 38.1 million in 2000, an increase of 12 percent. Enrollment in grades K–8 is projected to increase slightly to 38.2 million in 2001, and then decrease slowly through 2008 to 37.3 million. Thereafter, elementary enrollment is expected to begin increasing again, rising to 37.5 million by 2010.

Enrollment in grades 9–12 has risen from 12.5 million in 1990 to a projected 14.9 million in 2000, an increase of 19 percent. In the year 2005, enrollment in grades 9–12 is projected to reach an all-time record of 15.9 million, surpassing the previous high of 15.7 million in 1976. Thereafter, enrollment in grades 9–12 is projected to rise to 16.0 million in 2006, before decreasing slightly to 15.5 million by 2010, resulting in an increase of 4 percent from 2000.

Public school enrollment by region and state

While public elementary and secondary school enrollment (kindergarten through grade 12) is expected to increase by 0.5 percent at the national level between 1999 and the year 2010, changes in enrollment will vary by region and by state (figure A).

Regionally, public elementary and secondary school enrollment will increase moderately in the West, where total enrollment is expected to rise 7 percent between 1999 and 2010. Enrollment in the South is projected to increase by 1 percent. Enrollment is expected to decrease by 4 percent in the Northeast and by 3 percent in the Midwest.

At the state level, changes in public school enrollment are projected to range from increases of 10 percent or more in some states to decreases in other states between 1999 and 2010. The largest increases are expected in Alaska (12 percent), Arizona (12 percent), Hawaii (12 percent), Idaho (16 percent), Nevada (15 percent), and New Mexico (14 percent).

Higher Education Enrollment

Overall enrollment in institutions of higher education is expected to rise between 1998 and the year 2010. Changes in age-specific enrollment rates and college-age populations will affect enrollment levels over this period. The most important factor in the projected rise of college enrollment is the projected increase of 18 percent in the traditional college-age population of 18- to 24-year-olds from 1998 to 2010.

Under the middle alternative, total higher education enrollment is projected to increase from an estimated 14.6 million in 1998 to 17.5 million by the year 2010 (figure B), an increase of 20 percent. A 17 percent increase is projected under the low alternative, and a 24 percent increase is projected under the high alternative. The remainder of this discussion focuses on higher education enrollment projections under the middle alternative.

College enrollment by sex

As a share of total college enrollment, women were 57 percent of all college students in 1998 compared with

Table A.—Enrollment in grades K–8 and 9–12 of elementary and secondary schools, by control of institution, with projections: Fall 1985 to fall 2010

(In thousands)

	Total			Public			Private		
Year	K–12[1]	K–8[1]	9–12	K–12[1]	K–8[1]	9–12	K–12[1]	K–8[1]	9–12
1985[2]	44,979	31,229	13,750	39,422	27,034	12,388	5,557	4,195	1,362
1986	45,205	31,536	13,669	39,753	27,420	12,333	5,452	4,116	1,336
1987[2]	45,487	32,165	13,323	40,008	27,933	12,076	5,479	4,232	1,247
1988[2]	45,430	32,537	12,893	40,188	28,501	11,687	5,242	4,036	1,206
1989[3]	45,898	33,314	12,583	40,543	29,152	11,390	5,355	4,162	1,193
1990[3]	46,449	33,973	12,475	41,217	29,878	11,338	5,232	4,095	1,137
1991[3]	47,246	34,580	12,666	42,047	30,506	11,541	5,199	4,074	1,125
1992[3]	48,198	35,300	12,898	42,823	31,088	11,735	5,375	4,212	1,163
1993[3]	48,936	35,784	13,152	43,465	31,504	11,961	5,471	4,280	1,191
1994[4]	49,707	36,258	13,449	44,111	31,898	12,213	5,596	4,360	1,236
1995[4]	50,502	36,806	13,697	44,840	32,341	12,500	5,662	4,465	1,197
1996	51,394	37,250	14,144	45,611	32,764	12,847	5,783	4,486	1,297
1997[4]	51,987	37,625	14,362	46,127	33,073	13,054	5,860	4,552	1,308
1998[4]	52,409	37,941	14,518	46,535	33,344	13,191	5,924	4,597	1,327
				Projected					
1999	52,750	38,037	14,714	46,812	33,437	13,375	5,938	4,599	1,339
2000	52,989	38,132	14,857	47,026	33,521	13,505	5,963	4,611	1,352
2001	53,155	38,172	14,982	47,176	33,557	13,619	5,979	4,616	1,363
2002	53,287	38,157	15,130	47,296	33,543	13,753	5,991	4,614	1,377
2003	53,367	38,042	15,325	47,373	33,442	13,931	5,995	4,600	1,395
2004	53,429	37,809	15,620	47,436	33,237	14,199	5,993	4,572	1,422
2005	53,465	37,598	15,868	47,475	33,051	14,423	5,990	4,546	1,444
2006	53,435	37,442	15,992	47,452	32,915	14,537	5,983	4,527	1,455
2007	53,336	37,352	15,985	47,365	32,835	14,530	5,971	4,517	1,455
2008	53,174	37,340	15,834	47,218	32,825	14,393	5,956	4,515	1,441
2009	53,056	37,399	15,657	47,109	32,877	14,232	5,947	4,522	1,425
2010	53,016	37,538	15,478	47,068	32,999	14,069	5,948	4,539	1,409

[1]Includes most kindergarten and some nursery school enrollment.

[2]Private school numbers are estimated on the basis of past data.

[3]Private school numbers are from the Early Estimates Survey, 1989–93.

[4]Private school numbers are projected.

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of Public Elementary and Secondary Schools*; Common Core of Data (CCD) surveys, 1985–86 through 1999–2000; 1985 Private School Survey; Private School Survey (PSS), 1995–96; *Public and Private Elementary and Secondary Education Statistics, Early Estimates*; and National Elementary and Secondary Enrollment Model. (Originally published as table 1 on p. 12 of the complete report from which this article is excerpted.)

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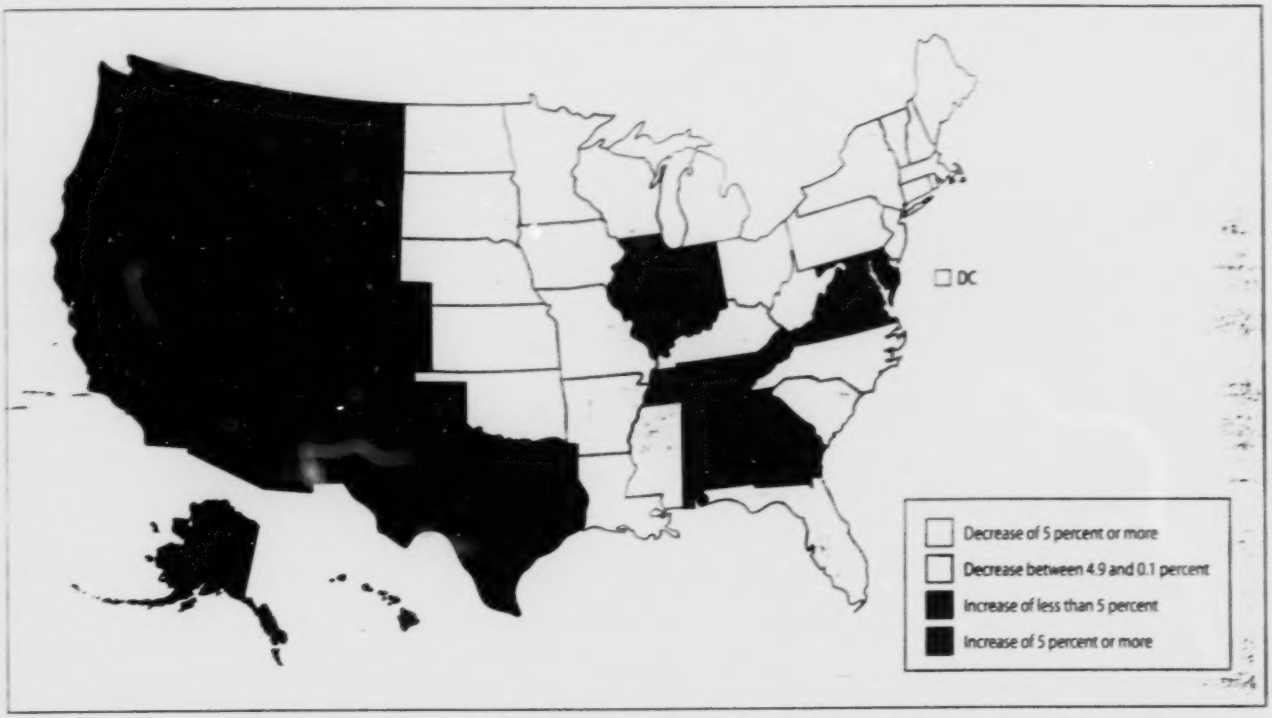
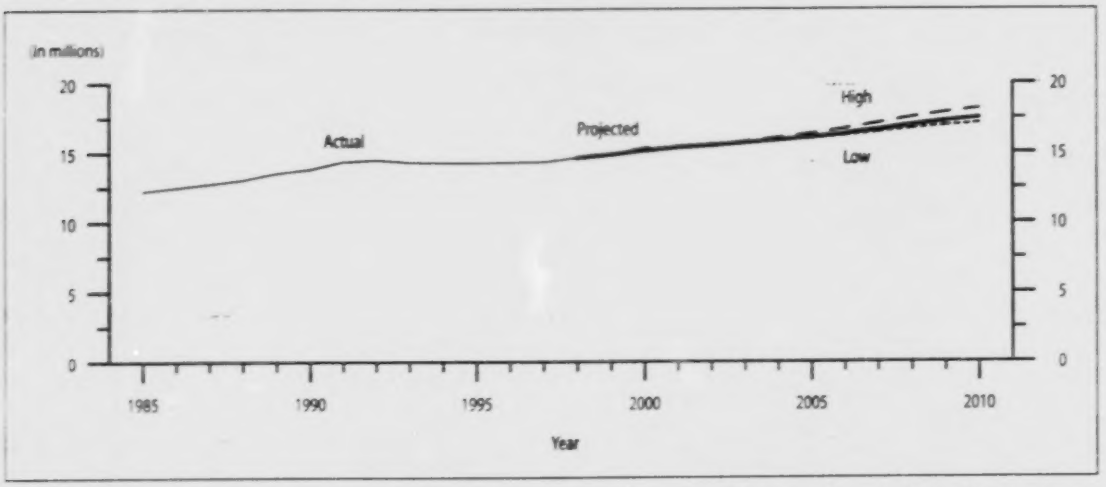
Figure A.—Percent change in grades K–12 enrollment in public schools, by state: Fall 1999 to fall 2010


DC
Decrease of 5 percent or more
Decrease between 4.9 and 0.1 percent
Increase of less than 5 percent
Increase of 5 percent or more

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Early Estimates of Public Elementary/Secondary Education Survey," 1999–2000; and State Public Elementary and Secondary Enrollment Model. (Originally published as figure 7 on p. 9 of the complete report from which this article is excerpted.)

Figure B.—Enrollment in institutions of higher education, with alternative projections: Fall 1985 to fall 2010



SOURCE: U.S. Department of Education, National Center for Education Statistics, Higher Education General Information Survey (HEGIS), "Fall Enrollment in Colleges and Universities", 1987–99 Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:1987–99); and Higher Education Enrollment Model. (Originally published as figure 15 on p. 29 of the complete report from which this article is excerpted.)

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52 percent in 1985. Women are expected to increase their share to 58 percent of college enrollment in the year 2010.

College enrollment by age

The enrollment of students who are 18 to 24 years old increased from 7.9 million in 1990 to an estimated 8.4 million in 1998, an increase of 7 percent. However, this number is expected to increase to 10.5 million by the year 2010, an increase of 25 percent from 1998. As a result, the proportion of students who are 18 to 24 years old, which remained at 57 percent in 1990 and 1998, is projected to be 60 percent by the year 2010.

The enrollment of students who are 25 years and over increased from 5.8 million in 1990 to an estimated 6.1 million in 1998, an increase of 5 percent. This number is projected to be 6.8 million in 2010, an increase of 11 percent from 1998. The proportion of students 25 years old and over remained at 42 percent in 1990 and 1998. It is projected to be 39 percent by the year 2010.

High School Graduates

High school graduates from public and private high schools are projected to increase from 2.7 million in 1997–98 to 3.1 million by 2009–10, an increase of 14 percent. This significant increase reflects the projected rise in the 18-year-old population.

Between 1998–99 and 2009–10, the number of graduates from public high schools is projected to increase 12 percent, but growth will vary by region. In the West, the number of public high school graduates is expected to rise by 20 percent over this period. In the Northeast, it is projected to grow by 11 percent. The South and Midwest are expected to have increases of 13 percent and 4 percent, respectively.

Increases in the number of public high school graduates are projected for most states between 1998–99 and 2009–10. Sizable increases are expected in Arizona (48 percent), Florida (28 percent), Nevada (79 percent), and North Carolina (31 percent).

Earned Degrees Conferred

The total number of earned degrees conferred by institutions of higher education increased substantially between 1984–85 and 1997–98, largely because of the historical growth in enrollment of and degrees earned by women. Between 1984–85 and 1997–98, the number of degrees awarded to women rose at all levels. In 1997–98, women earned the majority of associate's, bachelor's, and master's degrees, and more than two-fifths of doctor's and first-professional degrees.

From 1997–98 to 2009–10, increases in the total number of earned degrees are expected to continue. In particular, the total number of degrees at the bachelor's level is projected to increase from 1,175,000 in 1997–98 to 1,324,000 by 2009–10, an increase of 13 percent. Over the same period, the number of degrees awarded to women is projected to rise at all levels. While degrees awarded to men are projected to increase or remain steady at the associate's, bachelor's, and doctor's levels over this period, they will decrease at the master's and first-professional levels.

Elementary and Secondary Teachers

Between 1998 and 2010, the number of teachers in elementary and secondary schools is projected to rise, primarily due to the increase in school enrollment during this period. Increases are expected in the numbers of both elementary and secondary teachers. The number of secondary teachers will increase at a faster rate than the number of elementary teachers. The numbers of both public and private school teachers are projected to grow. Under the middle alternative, the total number of elementary and secondary teachers is expected to increase from 3.22 million in 1998 to 3.35 million by the year 2010, an increase of 4 percent. A 2 percent increase is projected under the low alternative, and a 7 percent increase is projected under the high alternative.

Expenditures of Public Elementary and Secondary Schools

Current expenditures and teacher salaries in public elementary and secondary schools are expected to increase in constant dollars.

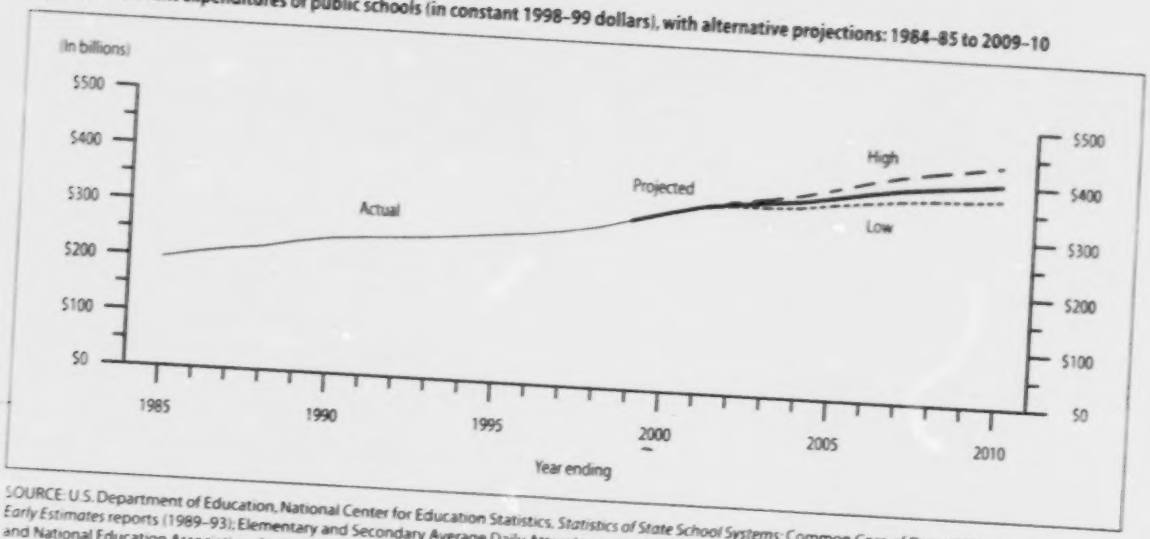
Current expenditures of public schools

Under the middle alternative, current expenditures of public elementary and secondary schools are forecast to increase 38 percent in constant dollars, from $290.4 billion in 1997–98 to $401.9 billion in 2009–10 (figure C). Under the low alternative, current expenditures are projected to increase by 29 percent; under the high alternative, current expenditures are projected to increase by 50 percent.

Current expenditures per pupil in public schools

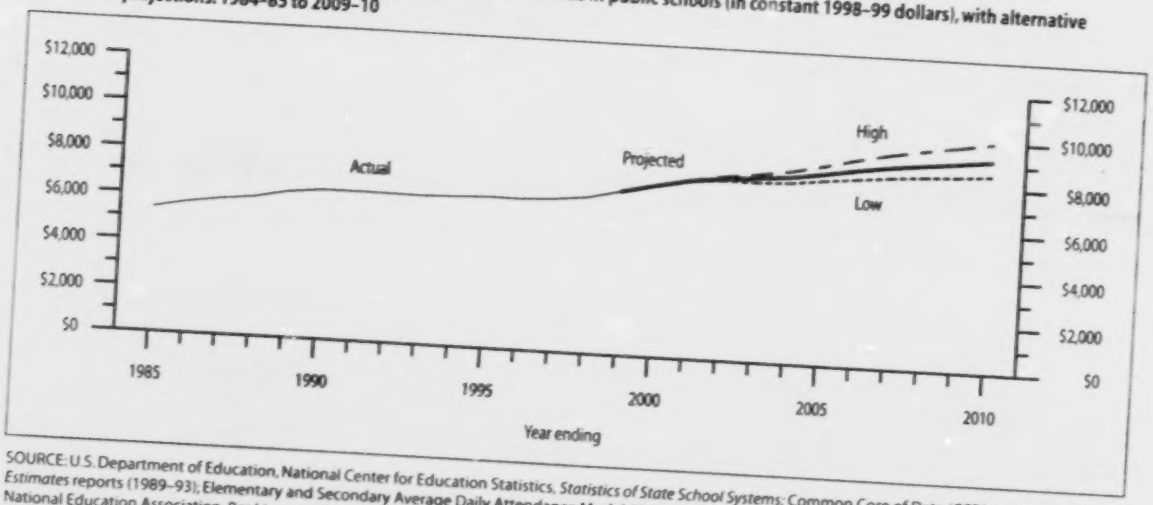
Under the middle alternative, current expenditures per pupil in average daily attendance are forecast to increase 36 percent in constant dollars, from $6,777 in 1997–98 to $9,204 in 2009–10 (figure D). Under the low alternative, current expenditures per pupil are projected to increase

Figure C.—Current expenditures of public schools (in constant 1998–99 dollars), with alternative projections: 1984–85 to 2009–10



SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems*; Common Core of Data (CCD) surveys; *Early Estimates* reports (1989–93); Elementary and Secondary Average Daily Attendance Model; Elementary and Secondary School Current Expenditure Model; and National Education Association, *Rankings and Estimates: Rankings of the States 1999 and Estimates of School Statistics 2000* (copyright 1999 by the National Education Association; all rights reserved). (Originally published as figure 53 on p. 94 of the complete report from which this article is excerpted.)

Figure D.—Current expenditures per pupil in average daily attendance in public schools (in constant 1998–99 dollars), with alternative projections: 1984–85 to 2009–10



SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems*; Common Core of Data (CCD) surveys; *Early Estimates* reports (1989–93); Elementary and Secondary Average Daily Attendance Model; Elementary and Secondary School Current Expenditure Model; and National Education Association, *Rankings and Estimates: Rankings of the States 1999 and Estimates of School Statistics 2000* (copyright 1999 by the National Education Association; all rights reserved). (Originally published as figure 54 on p. 94 of the complete report from which this article is excerpted.)

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26 percent; under the high alternative, current expenditures per pupil are projected to increase 47 percent.

Teacher salaries in public schools

Teacher salaries are projected to increase 7 percent in constant dollars between 1998–99 and 2009–10 under the middle alternative. A 4 percent increase is projected under the low alternative, and an 11 percent increase is projected under the high alternative.

Current-Fund Expenditures of Institutions of Higher Education

From 1995–96 to 2009–10, current-fund expenditures are projected to increase in constant dollars in both public and private institutions of higher education. Under the middle alternative, total current-fund expenditures are projected to increase 50 percent in constant dollars. A 52 percent increase is projected for public institutions under the middle alternative, and a 45 percent increase is projected for private institutions.

Data sources:

NCES: Common Core of Data (CCD); Private School Survey (PSS); Private School Early Estimates Survey; Higher Education General Information Survey (HEGIS); and Integrated Postsecondary Education Data System (IPEDS).

Other: The U.S. Bureau of the Census's Current Population Survey; the National Education Association's *Rankings and Estimates: Rankings of the States 1999 and Estimates of School Statistics 2000*; and Standard & Poor's DRI (an economic forecasting service).

For technical information, see the complete report:

Gerald, D.E., and Hussar, W.J. (2000). *Projections of Education Statistics to 2010* (NCES 2000–071).

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For questions about content, contact Debra E. Gerald (*debra_gerald@ed.gov*).

To obtain the complete report (NCES 2000–071), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site (*http://nces.ed.gov*), or contact GPO (202–512–1800).

Invited Commentary: The Baby Boom Echo Goes to College—by the Millions

Richard W. Riley, U.S. Secretary of Education

This commentary represents the opinions of the author and does not necessarily reflect the views of the National Center for Education Statistics.

Introduction

As our nation grows larger and more diverse, it is more important than ever for policymakers to make full use of the many statistical resources that are available to us. Federally funded research enables policymakers at all levels to determine relative needs for services across many dimensions of America: geographic, demographic, economic, and social. Our democratic system thrives on the free flow of accurate information and the consequent informed discussion among the people and their representatives.

My office relies on the National Center for Education Statistics (NCES) to gather and analyze data about our education system in a systematic, unbiased, and comprehensive manner. Several recent NCES reports provide examples of how data have been used by U.S. Department of Education officials to identify and track important policy needs. These reports—*Projections of Education Statistics to 2010* (featured in this issue of the *Quarterly*), *Predicting the Need for Newly Hired Teachers in the United States to 2008–09* (Hussar 1999), and *Condition of America's Public School Facilities: 1999* (Lewis et al. 2000)—helped inform the Department's most recent back-to-school special report, entitled *Growing Pains: The Challenge of Overcrowded Schools Is Here to Stay* (U.S. Department of Education 2000).

During the 1990s, the so-called "baby boom echo"—the children of the baby boom generation, along with the children of new immigrants—swelled the ranks of our elementary schools. *Projections of Education Statistics to 2010*, the latest edition of an annual report by NCES, confirms that K–12 enrollment will continue to set new records for several years.

The *Projections* report also finds that the population surge has now moved full force into the high school and postsecondary education spheres. In order to be effective, education policies at the local, state, and national levels need to reflect the changes in student enrollment that are predicted in the *Projections* report. By focusing our efforts on three main areas—teachers and facilities, college-going opportunities, and educational technology—I believe that today's policymakers can help build the infrastructure to provide excellent educational opportunities for future generations.

Teachers and Facilities

First, we need to continue and strengthen local, state, and national initiatives to recruit and prepare well-qualified teachers and to build better facilities.

In order to recruit and retain teachers, some school districts and states have considered or offered signing bonuses, subsidized housing, higher salaries, and other incentives. In Cobb County, Georgia, for example, new teachers receive a signing bonus that can range from $750 to $1,500. A proposal in Maryland would offer reduced home mortgage rates for teachers in the state's public schools. These kinds of creative efforts may serve as models for other communities and states trying to improve teaching and learning.

While education is a state responsibility and a local function, it is also a national priority. That is why President Clinton has urged Congress to honor its commitment to hire 100,000 new, well-trained teachers to reduce class size in the early grades. Sometime before this article is published, we should know whether Congress has appropriated funds in next year's budget to continue the Class-Size Reduction program, which has already hired 29,000 teachers in schools across the country. Also, the Troops to Teachers program recruits former members of the military to become teachers in high-need subject areas and school districts.

The administration's budget request for next year includes the Hometown Teachers proposal, which would help high-poverty districts address longstanding teacher shortages. In August, the U.S. Department of Education announced a new student loan forgiveness program for teachers who work at schools in needy areas. In addition, President Clinton recently announced a new Web site, *http://www.recruitingteachers.org*, financed by the U.S. Department of Education and run by Recruiting New Teachers, Inc., that can help teachers seeking jobs and school districts working to hire or retain teachers.

The increase in student enrollment has created not only a shortage of teachers, but also a shortage of classrooms. Again, policymakers and community leaders are trying to respond. Some communities have passed bonds to build new schools or renovate existing schools, and some states have increased their support for school construction. But the spending has not kept pace with the need. An estimated $127 billion is needed to bring America's schools into good overall condition, according to the NCES *Condition of America's Public School Facilities* report (Lewis et al. 2000).

In this area as well, viable solutions have been proposed. A bipartisan bill before the U.S. House of Representatives would help communities finance school renovations. The Johnson-Rangel bill's innovative financing mechanism is a cost-effective approach that would leverage nearly $25 billion in school repairs and new construction, while avoiding the creation of new federal programs or bureaucracy. Repairing and reconstructing our public schools is essential to the success of our nationwide effort to ensure that every student has access to a safe, healthy, and modern learning environment.

The President's School Renovation proposal would supplement the Johnson-Rangel bill by extending federal funding to poor communities that cannot issue bonds. The School Renovation initiative would provide grants and interest-free federal loans to needy school districts in order to fund urgent renovations. Well-equipped schools and well-qualified teachers are two important factors in reaching our goal of providing a quality education for every child in America.

College-Going Opportunities

The second area that policymakers need to focus on is to increase college-going opportunities, especially for disadvantaged young people.

One of the most significant findings of *Projections of Education Statistics to 2010* is that enrollment in higher education is expected to rise to 17.5 million by the year 2010, an increase of 20 percent from 1998. As more and more high school graduates compete for a limited number of slots in college, it is important to build on our nation's recent progress in encouraging low-income and minority students to attend college.

I am pleased that the U.S. Department of Education has a number of initiatives designed to help prepare low-income and minority students for college and to strengthen the institutions that serve them. The GEAR UP and TRIO programs support college attendance among students from disadvantaged backgrounds. For GEAR UP, the focus is on providing mentors who can help middle school students begin to succeed in challenging courses that will prepare them for college. The TRIO programs identify promising high school students from disadvantaged backgrounds, encourage them to strive for college, and prepare them to succeed in college.

But preparing students for college coursework is only half the battle: we also have to make sure that their families can afford to pay for college. The U.S. Department of Education's Student Financial Assistance office is working to make higher education affordable for everyone. In recent years, tax credits, expanded Pell Grants, and work-study positions have made it easier for Americans to pursue postsecondary schooling. Furthermore, in the administration's budget request for next year, the President has proposed the College Opportunity Tax Cut, which would give investments in postsecondary education the same tax advantage as investments in a family home.

Even as we make college more accessible and more affordable for low-income and minority students, we need to make sure that the institutions they attend are of high quality. Education is the key civil right for the 21st century. To guarantee this right for all, a portion of federal funds are targeted toward the two largest minority groups in the United States—African Americans and Hispanics. For example, federal funding supports Historically Black Colleges and Universities (HBCUs). In 1995, HBCUs matriculated 26 percent of all African-American students enrolled in 4-year colleges, awarded master's degrees and first-professional degrees to about 1 in 6 African-American men and women who earned such degrees, and awarded 27 percent of all baccalaureate degrees earned by African Americans nationwide (Snyder 1997). More than 40 percent of Hispanic students are in Hispanic-Serving Institutions (HSIs), which are accredited and degree-granting public or private nonprofit institutions of higher education with at least 25 percent or more total undergraduate Hispanic full-time-equivalent student enrollment. By supporting high-quality education at HBCUs and HSIs,

federal funding can help ensure that graduates of these institutions are prepared to succeed in the workplace.

Educational Technology

Finally, local, state, and federal policymakers need to be prepared to adapt policies to support effective educational technology.

Distance learning and Web-based education will never become a substitute for the traditional college experience, but they can expand opportunities. Over the course of a career, a knowledgeable, caring professor can have a longlasting influence on thousands of young people. With technology, college-level instruction can reach even more students, even those in remote or underserved areas. And technology provides more resources for professors and students alike.

Through initiatives like the U.S. Department of Education's Learning Anytime Anywhere Partnerships (LAAP) grants, government can encourage innovations in higher education. Under LAAP, colleges work with each other and with businesses and organizations to develop programs to expand high-quality learning opportunities—often making use of Internet technology—that students can access anytime, anywhere. The LAAP initiative is especially effective for individuals who have limited access to a traditional college campus because of their geographic location, a physical disability, or scheduling conflicts created by competing demands of work and family.

As postsecondary education changes, private-public partnerships and consortia like the Southern Regional Education Board will continue to play an important role, as they have, for example, in establishing online college-level coursework. But public policy should guarantee that students at online universities are well served and that public funds supporting these institutions are well used.

Conclusion

In each of these three areas, our actions today will affect education for generations to come. The *Projections* report identifies many of the challenges that lie ahead for our nation's schools. To meet those challenges, we will need a federal-state-local partnership that invests in K–12 education, continues to make expanding college access a top priority, and adapts education policies as technology changes. If we take these steps, we can provide excellent educational opportunities for every American.

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Invited Commentary: Meeting Greater Expectations and Greater Needs for Education Data

Lavan Dukes, Bureau Chief, and Edward Croft, Program Specialist, Education Information and Accountability Services, Florida Department of Education

This commentary represents the opinions of the authors and does not necessarily reflect the views of the National Center for Education Statistics.

Greater Expectations and Needs for Education Data

With renewed emphasis on accountability in public education, it appears that the more we prove ourselves capable of doing—even with finite resources—the more we are expected to do. This is not a complaint. The expectation to do more is justifiably applied to teachers, students, education administrators, and education agencies alike, and it is necessary if the coming generation of Americans is to have the requisite skills to thrive in an increasingly high-tech and intricately networked world. The expectation of doing more with what's available is therefore founded at least as much on need as on hope. And the fulfillment of such need can only be accomplished through effective partnering of education leadership at national, state, and local levels. This is especially true for those of us who work with education management information systems (MIS).

Uses and benefits of education data

The needs and expectations for more and better education data to support informed decision making at all levels also underlie the importance of National Center for Education Statistics (NCES) publications such as *Projections of Education Statistics to 2010*. In education planning and policymaking, we need to see where we're heading in order to steer the course. The annual *Projections* report features the kinds of data (on enrollment, graduates, teachers, and expenditures) that are fundamental to assessing areas of greatest need and planning how best to allocate education resources in the near future. We need to know, for example, where growth in enrollment is most likely to occur (which grades or regions), whether there will be enough teachers to go around (and whether any shortages will be regional or nationwide, generalized or concentrated in specialized fields), to what extent overcrowded classrooms are likely to present problems, how much the costs of education are likely to rise, who will be able to afford higher education, and whether teachers will be adequately compensated for their work and performance (i.e., whether we will be able to attract and retain professionals for a competent teacher workforce).

Moreover, states need comparative state-level data produced through a consistent methodology, such as the data provided by the maps and state-level tables in the *Projections of Education Statistics* series and several other NCES publications. State education agencies rely on a supply of such data to understand where they stand in relation to other states (for instance, to assess how states with similar demographics and/or economies have addressed common challenges). Further, state education agencies have already begun to benefit from cross-state information-sharing practices, from ongoing expansion of networking capabilities, and from movement toward greater compatibility among information management systems. For example, many states and districts have borrowed from other states in researching interactive Web-site report designs, distance learning initiatives, and other areas in education services, including database design, MIS, and comprehensive statewide school-level reporting. Hence, states are able to derive tangible benefits from comparable and comparative state-level data.

As technological advances continue, state education agencies will increasingly be expected to use data from or about other states in modeling programs and initiatives to improve education locally. Advances in technology not only increase our ability to manage data, but also promote an even greater need for data. Success in answering a technically challenging question often generates a greater challenge to our capabilities.

Desire for accurate universe data

The public's trust of education data, including statistical projections, may be affected by factors such as type of survey and level of error. Some staff in education information management have the sense that, for some policymakers, appreciation of the statistical usefulness of sampling research is subordinated to a desire to "have it all," statistically speaking. That is, these policymakers prefer data from universe surveys over sample surveys. They prefer not to deal with sampling errors or even the possibility of sampling errors. They prefer to conceive of school data as providing a kind of snapshot of conditions as they

actually exist across the universe of the school system at a given point in time. It is apropos that, in Florida and a few other states, our capability to provide accurate universe survey data has increased with the development of an integrated education information system that allows for the tracking of individuals by data elements (such as unique student I.D. numbers that students retain as they move from grade to grade, school to school, or district to district). This technology has already had positive applications in many areas within Florida's public education system, including improved accuracy of reported graduation and dropout rates, as well as improved accuracy of baseline data for long-range projections.

With recognition of these increased data management capabilities comes increased intolerance of nonsampling errors, however. As noted earlier, once the ability to execute is demonstrated, the expectation of flawless execution becomes ingrained—necessarily so. This is the attitude we must strive to uphold in preparing data that will affect major decisions about the allocation of resources toward education.

Procedures to Ensure More Accurate Baseline Data

The greater the length of the forecast horizon, the greater the need to eliminate potential errors in baseline data, because any inaccuracies at the baseline perpetuate and even amplify themselves throughout the forecast. The effectiveness of the demographic and economic assumptions factored into NCES projections for enrollment, graduates, postsecondary enrollment, college degrees, teachers, and expenditures depends on the accuracy of the actual compiled data that form the starting point for the calculated projections. So, in a sense, data now being reported by school districts and compiled at the state level—especially if they are to be used for Common Core of Data (CCD) reporting—carry multiple burdens of responsibility: they have to be accurate for both the present and the future, for the benefit of one's own state and other states as well. What may not be readily apparent are the often tedious but necessary quality-control processes that must occur at both state and local levels before data are submitted to federal statistical agencies, which in turn provide some of the source data for *Projections of Education Statistics*.

Automated quality-control measures

As states are collecting more data from schools and districts, we've been compelled to implement comprehensive automated quality-control measures in the data-reporting process. That is, data submitted from school districts to the state education agency's database must comply with a series of edit rules to ensure that erroneously formatted data are not entered into the state system. The erroneous data are rejected (via reject rules), and the submitting district receives electronic notification of the rejected data so that the data may be resubmitted in correct format. At this level of reporting, greater efficiencies are achieved when (1) data elements have been adequately defined at the national and state levels and adequately communicated to local districts and (2) guidelines for data submission have likewise been adequately developed and communicated.

While extensive guidelines and edit rules for data submission can eliminate errors in the formatting of data (a missing digit in a school number, a transposed digit in a birth date, etc.), other measures are required to ensure the accuracy of records that make it through the edit rules to reside in the state education agency's database.

Review of data

In a sense, the accuracy of data—and hence, its utility—is only as good as the weakest link in the chain of reporting. Weakness that goes unchecked at any level of data transmission is perpetuated at every subsequent level. For instance, inaccurate enrollment data reported from a school to the district and from the district to a state-level database, if left uncorrected, may then affect the accuracy of the aggregated state enrollment data, which then are sent to a federal statistical agency to be compiled for the universe data on states. And these data may later be returned to the state in the federal agency's published compilations and projections that include comparative state-level data.

Strengthening the links between each level of data reporting and the next is therefore critical to improving the quality of data from which comparative results as well as projections are derived. At the same time, with the increasing volume and types of school data being processed, there must be some selectivity in determining how data submitted by schools and districts should be reviewed at each level prior

to passing them to the next level and/or incorporating them in published reports. The selection of data for review depends on several factors, including the data's impact on other forms of data, the expected visibility of the data, the audience for the data, and the data's expected impact on decision making.

Effective data review is dependent on communication between state and district personnel and typically includes (or should include) a process whereby targeted types of data (for example, indicators used in annual school reports) are compiled at the state level and then presented or made accessible to MIS staff, program staff, and principals in all school districts for verification prior to public reporting. In essence, we (at the state level) are saying to school districts: "This is what you sent us. Are you sure it's correct?" At some point, however, there has to be a level of trust regarding the quality of data being reported, and that trust is fostered within the public education system by having MIS and other staff communicate effectively at and between the local and state levels. Within Florida, a new initiative is underway to conduct a series of data-review workshops in individual school districts for school district staff, with the objectives of troubleshooting reporting problems and increasing both the efficiency of reporting and the quality of initial data submissions.

Shared Responsibility for and Benefits From High-Quality Data

At the national level, progress has been made in reducing nonsampling errors in data from universe surveys, thus increasing the scope and accuracy of national statistical data that can be used by policymakers and researchers at all levels. To the extent that we (at the state level) are able to provide more accurate universe survey information for national statistical surveys, which may in turn provide source data for projections, we may be able to contribute in some small way to the public acceptance and usefulness of projections of education statistics. Not only do the projections provide us with a complement to trend data we prepare for our own state's schools, but they help us appreciate objectively where we reside among all states and where we are heading.

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Children Who Enter Kindergarten Late or Repeat Kindergarten: Their Characteristics and Later School Performance

Jerry West, Anne Meek, and David Hurst

This article was originally published as a Stats in Brief. The sample survey data are from the NCES National Household Education Survey (NHES).

Delay their start? Let them try, and maybe repeat, kindergarten? These are questions parents and teachers may ask in trying to match children's readiness levels with the demands of schooling. In recent years, schools have changed the age of eligibility for entry into kindergarten. Once it was standard practice to require kindergartners entering in September to have turned 5 by the following December or January; now it has become increasingly common for schools to require that children have turned 5 by September or October. But raising the age of eligibility has not eliminated variations in children's readiness for school, and parents and teachers have used delayed entry and retention as strategies to accommodate these variations.

This Stats in Brief uses information from the 1993 and 1995 National Household Education Survey (NHES) to describe the numbers and characteristics of children who experienced delayed kindergarten entry or kindergarten retention, as well as their subsequent performance and adjustment in school. As defined in NHES, children who experienced delayed entry into kindergarten are those whose parents enrolled them in kindergarten after the eligible age to start school according to the guidelines of their school district. Children who were retained in kindergarten are those who attended 2 or more years of kindergarten before entering first grade.

Numbers and Characteristics of Delayed-Entry and Retained Children

Children with delayed entry into kindergarten

In both the 1993 and 1995 NHES, parents reported that 9 percent of all first- and second-graders had been held out of kindergarten (table 1). The 1993 and 1995 NHES found that boys experienced delayed entry more often than girls—10 versus 7 percent in 1993, and 11 versus 6 percent in 1995. Children born in the latter half of the year, and thus relatively young at the time they were eligible to enter kindergarten, were also more likely to have been held out of kindergarten. In 1995, white, non-Hispanic children were twice as likely as black, non-Hispanic children to have entered kindergarten late. In 1993, but not in 1995, pupils who had been diagnosed as being developmentally delayed* were twice as likely as other pupils to have been held out of kindergarten.

Children retained in kindergarten

The overall prevalence of kindergarten retention was similar in the 1993 and 1995 NHES, affecting 6 percent of pupils in 1993 and 5 percent in 1995 (table 1). As with delayed kindergarten entry, boys were retained in kindergarten more often than girls. In both 1993 and 1995, children who had a diagnosed delay in growth or development were several times more likely to be retained in kindergarten. In 1995, for example, 16 percent of the developmentally delayed

*Developmental delay is a condition in which children have fallen behind in physical, cognitive, motor, or speech development compared to what is typical for their age.

Table 1.—Percentage of first- and second-graders who experienced delayed entry into kindergarten and who repeated kindergarten, by child characteristics: 1993 and 1995

Characteristics	1993		1995	
	Delayed entry into kindergarten	Repeated kindergarten	Delayed entry into kindergarten	Repeated kindergarten
Total	9	6	9	5
Child's sex				
Male	10	7	11	6
Female	7	5	6	4
Time of year child born				
1st quarter (Jan–Mar)	6	4	5	4
2nd quarter (Apr–Jun)	5	7	6	4
3rd quarter (Jul–Sep)	11	6	11	5
4th quarter (Oct–Dec)	13	6	13	6
Child's race/ethnicity				
White, non-Hispanic	9	5	10	4
Black, non-Hispanic	6	8	5	7
Hispanic	10	5	9	5
Other races	5	7	9	6
Doctor has said child developmentally delayed				
Yes	18	18	11	16
No	8	5	9	4

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey (NHES), "School Readiness" (SR) component, 1993, and "Early Childhood Program Participation" (ECPP) component, 1995, as published in *The Elementary School Performance and Adjustment of Children Who Enter Kindergarten Late or Repeat Kindergarten: Findings From National Surveys* (NCES 98-097).

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children were retained, compared to 4 percent of other children.

School Performance and Adjustment of Delayed-Entry and Retained Children

Children with delayed entry into kindergarten

In 1993, parents of children who had experienced delayed entry into kindergarten received less negative feedback from teachers on two of five indicators, while in 1995, parents of children whose entry was delayed were less likely to report school performance problems on one of four indicators (table 2). In 1993, for example, 17 percent of delayed-entry children were reported to be *not learning up to their capabilities*, compared to 24 percent of those who entered kindergarten at the prescribed time. Also, 25 percent of delayed-entry children were said to have *problems concentrating in class*, compared to 30 percent of those who entered kindergarten as soon as they were age-eligible. However, the timing of kindergarten entry was not related to the other indicators. In 1995, children whose entry into kindergarten had been delayed were half as likely as those entering when age-eligible to have repeated first or second grade. On the other indicators, however, those who were held out of kindergarten performed as well as those who started kindergarten when eligible.

Children retained in kindergarten

Children who had been required to spend 2 or more years in kindergarten performed significantly worse than their first- and second-grade classmates on all five of the 1993 indicators and on two of the four 1995 indicators (table 2). In 1993, 40 percent of the retained pupils were said to have *problems concentrating*; more than a third, to be *not learning up to their capabilities*; and 29 percent, to be *acting up or disrupting the class*. All of these proportions were 40 to 50 percent higher than those for children who had not been retained in kindergarten. While less than a fifth of the retained pupils were said to have *trouble taking turns or sharing with others*, this proportion was twice as high as that for nonretained pupils. In 1995, more of the retained pupils had schoolwork that ranked around the middle or in the lower half of the class. Nearly 30 percent of retained children had their parents contacted by the teacher or school in the last year because of a schoolwork problem;

Table 2.—Percentage of first- and second-graders with school performance problems, by experience with delayed kindergarten entry and kindergarten retention: 1993 and 1995

School performance problems	Delayed entry into kindergarten		Repeated kindergarten	
	Yes	No	Yes	No
1993				
Since the beginning of this school year, a teacher has said or written that child ...				
Has not been learning up to capabilities	17	24	34	23
Does not concentrate or pay attention for long	25	30	40	29
Has been acting up or disrupting class	21	21	29	20
Has been very restless, fidgets	17	19	27	18
Has been having trouble taking turns or sharing with others	10	9	18	9
Child received negative feedback on at least one item above	42	49	65	48
1995				
Compared to others in class, child's schoolwork is around the middle or below	34	33	45	32
Teacher/school said child having behavior problems	18	19	26	19
Teacher/school said child having schoolwork problems	21	21	29	20
Repeated 1st or 2nd grade	2	4	5	4
Any of four problems above	45	47	60	47

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey (NHES), "School Readiness" (SR) component, 1993, and "Early Childhood Program Participation" (ECPP) component, 1995, as published in *The Elementary School Performance and Adjustment of Children Who Enter Kindergarten Late or Repeat Kindergarten: Findings From National Surveys* (NCES 98-097).

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this percentage was about 40 percent higher than that for nonretained pupils. However, the proportion of those whose parents were contacted because of a behavior problem or who had to repeat first or second grade was comparable among children who had been retained and other children.

Delayed Entry, Kindergarten Retention, and School Performance: Multivariate Analysis

The previous section examined some of the associations between delayed kindergarten entry or kindergarten retention and school performance in the first and second grades. To what extent are these observed associations attributable to the demographic and socioeconomic factors with which delayed entry and retention are correlated? This question can be addressed with multivariate analyses that show the association of delayed kindergarten entry and kindergarten retention with early elementary school performance, while at the same time controlling for the child- and family-related factors that may also be associated with children's experiences with kindergarten entry and retention.

In 1993, after controlling for sex, time of birth, race/ethnicity, developmental delay, birth weight, parents' education level, household poverty status, number and type of parents with whom the child was living, language spoken in the home, and whether the child attended a center-based preschool program, first- and second-graders who had been held out of kindergarten until they were older were less likely than other children to elicit negative feedback from teachers. In contrast, the 1995 data indicated that delayed entry into kindergarten was not related to school performance problems in the first and second grades.

In 1993, kindergarten retention also showed a relationship with teacher feedback. First- and second-graders who were retained in kindergarten were more likely to get negative feedback from teachers. In contrast, an association between kindergarten repetition and negative teacher feedback was not evident in 1995.

In summary, when demographic, socioeconomic, and developmental factors were taken into account, the differences in school performance between delayed-entry students and other students were small, but significant in the 1993 survey data. In the 1995 survey data, however, controlling for these background factors essentially eliminated the differences between students who were held out and other first- and second-graders. The same was true of the performance differences between the students who had been retained and other students. NCES has begun a new longitudinal study of kindergartners that will allow more detailed investigation of any beneficial or harmful effects that delayed kindergarten entry or kindergarten retention may have on student performance. The initial findings from this study are reported in *America's Kindergartners* (West, Denton, and Germino-Hausken 2000).

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Data sources: The NCES National Household Education Survey (NHES), "School Readiness" (SR) component, 1993, and "Early Childhood Program Participation" (ECPP) component, 1995.

For technical information, see

Zill, N., Loomis, L., and West, J. (1997). *The Elementary School Performance and Adjustment of Children Who Enter Kindergarten Late or Repeat Kindergarten: Findings From National Surveys* (NCES 98-097).

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High School Dropouts, by Race/Ethnicity and Recency of Migration

This article was originally published as an Indicator of the Month, taken from* The Condition of Education: 1999. *The sample survey data are from the U.S. Census Bureau's Current Population Survey (CPS).

As a whole, Hispanics drop out of high school at higher rates and attain lower levels of education than non-Hispanics. The relative recency of migration among Hispanics may at least partially account for this trend. Evidence of the undereducation of Hispanics has implications for developing retention strategies as well as for assessing the educational and training needs of the population. The status dropout rate for an age group (the percentage of that age group that is not enrolled in school and has not completed high school) is one measure of dropping out.

- In 1997, a greater percentage of Hispanics than non-Hispanics ages 16–24 were born outside the United States (figure 1). Among this group, the status dropout rate (39 percent) was higher than it was among first- and later-generation Hispanics (15 and 18 percent, respectively) (table 1). First- and later-generation Hispanics were two to three times more likely than their non-Hispanic peers to drop out.
- In 1997, the percentage of 25- to 34-year-olds who were dropouts was lower than it was in 1989 or 1979. Similar changes are occurring for all groups. The gaps in dropout rates between non-U.S.-born, first-generation, and later-generation Hispanics and comparable non-Hispanics were generally similar in 1979, 1989, and 1997 (table 2 and figure 2).

Data source: U.S. Census Bureau, Current Population Survey (CPS), November 1979 and 1989, and October 1997.

For technical information, see

National Center for Education Statistics. (1999). *The Condition of Education: 1999* (NCES 1999–022).

For complete supplemental and standard error tables, see either

- the electronic version of *The Condition of Education: 1999* (*http://nces.ed.gov/pubs99/condition99/*), or
- volume 2 of the printed version: *The Condition of Education: 1999 Supplemental and Standard Error Tables* (NCES 2000–016).

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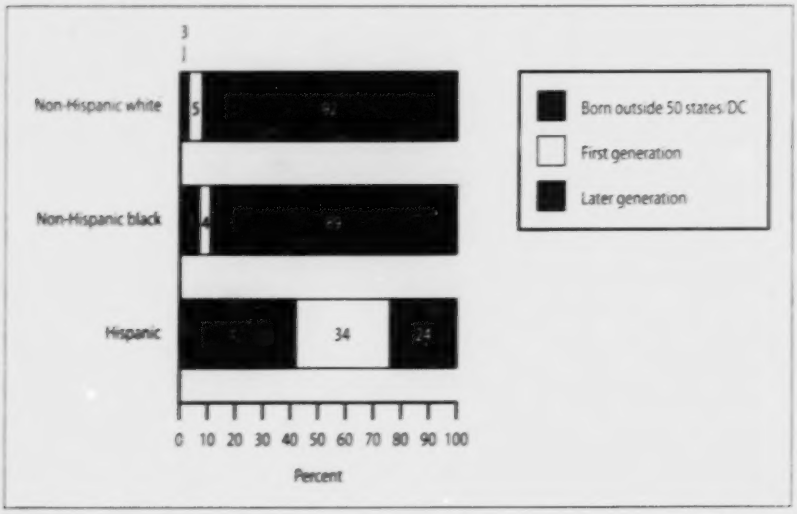
To obtain this Indicator of the Month (NCES 2000–009), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site (*http://nces.ed.gov*).

Figure 1.—Percentage distribution of 16- to 24-year-olds, by race/ethnicity and recency of migration: 1997



NOTE: People born in Puerto Rico and the U.S. territories are considered born in other countries. Individuals are classified as first generation if they were born in one of the 50 states or Washington, DC, and at least one of their parents was not. Later generation includes those who were born in one of the 50 states or Washington, DC, as were both of their parents.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), October 1997.

Table 1.—Percentage of 16- to 24-year-olds who were not enrolled in school and had not completed high school, by race/ethnicity and recency of migration: 1997

		Hispanic			Non-Hispanic			
Recency of migration	Total	Total	Mexican	Other Hispanic	Total	White	Black	Asian/ Pacific Islander
Total	**11.0**	**25.3**	**27.5**	**21.3**	**8.6**	**7.6**	**13.4**	**6.9**
Born outside 50 states/DC	23.5	38.6	44.3	29.6	7.8	5.4	9.2	9.4
First generation	10.0	15.4	17.0	7.9	5.0	5.6	6.2	2.5
Later generation	9.3	17.7	18.3	14.2	9.0	7.8	14.1	5.3

NOTE: People born in Puerto Rico and the U.S. territories are considered born in other countries. Individuals are classified as first generation if they were born in one of the 50 states or Washington, DC, and at least one of their parents was not. Later generation includes those who were born in one of the 50 states or Washington, DC, as were both of their parents.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), October 1997.

Table 2.—Percentage of 25- to 34-year-olds who were not enrolled in school and had not completed high school, by race/ethnicity and recency of migration: 1979, 1989, and 1997

		Hispanic			Non-Hispanic			
Recency of migration	Total	Total	Mexican	Other Hispanic	Total	White	Black	Asian/ Pacific Islander
1979 Total*	**14.9**	**45.4**	**51.2**	**24.6**	**13.0**	**11.5**	**24.1**	**—**
Born outside 50 states/DC	34.4	59.9	74.8	30.6	16.1	18.6	15.3	—
First generation	12.3	30.8	35.3	4.3	8.2	7.8	18.1	—
Later generation	13.5	29.9	32.8	18.3	13.1	11.5	24.4	—
1989 Total*	**13.1**	**39.1**	**45.9**	**27.6**	**10.5**	**9.1**	**18.9**	**10.5**
Born outside 50 states/DC	31.8	51.8	69.9	28.6	11.5	10.2	14.2	12.3
First generation	10.5	25.3	25.2	28.5	4.5	4.0	8.9	5.9
Later generation	11.2	23.0	23.7	19.7	10.8	9.4	19.3	3.9
1997 Total*	**11.9**	**38.5**	**46.2**	**27.8**	**7.7**	**6.6**	**12.2**	**9.3**
Born outside 50 states/DC	30.8	49.5	60.0	34.2	10.3	7.6	16.7	10.7
First generation	9.5	16.4	22.8	3.2	5.8	5.7	9.9	3.9
Later generation	8.1	24.0	26.8	12.5	7.5	6.6	11.9	3.2

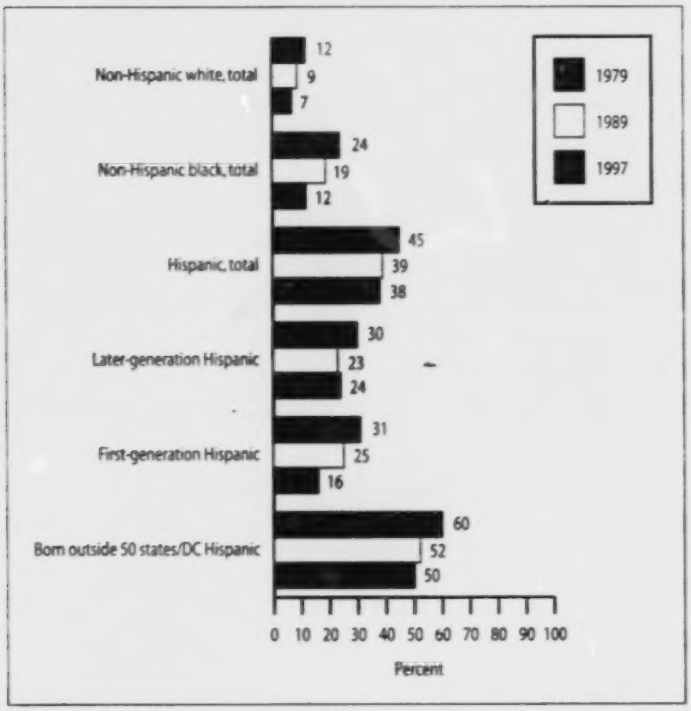
— Not available.

*Total includes a small proportion for whom recency of migration is unknown.

NOTE: People born in Puerto Rico and the U.S. territories are considered born in other countries. Individuals are classified as first generation if they were born in one of the 50 states or Washington, DC, and at least one of their parents was not. Later generation includes those who were born in one of the 50 states or Washington, DC, as were both of their parents.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), November 1979 and 1989, and October 1997.

Figure 2.—Percentage of 25- to 34-year-olds who were not enrolled and had not completed high school, by race/ethnicity and recency of migration: 1979, 1989, and 1997



NOTE: People born in Puerto Rico and the U.S. territories are considered born in other countries. Individuals are classified as first generation if they were born in one of the 50 states or Washington, DC, and at least one of their parents was not. Later generation includes those who were born in one of the 50 states or Washington, DC, as were both of their parents.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), November 1979 and 1989, and October 1997.

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Teacher Supply in the United States: Sources of Newly Hired Teachers in Public and Private Schools: 1987–88 to 1993–94

Stephen P. Broughman and Mary R. Rollefson

This article was excerpted from the Statistical Analysis Report of the same name. The sample survey data are from the NCES Schools and Staffing Survey (SASS).

Introduction

New college graduates with teacher education training have traditionally been the largest source of newly hired teachers each year in the nation's elementary and secondary schools. In the 1960s, for example, 67 percent of newly hired teachers in public schools were new college graduates. By the mid-1980s, however, this proportion had fallen to only 17 percent (National Education Association 1987). By that time, rising school enrollments, together with decreasing numbers of college graduates with education degrees, had led to increased concern about possible shortages in the supply of teachers. In school year 1987–88, the National Center for Education Statistics (NCES) implemented the Schools and Staffing Survey (SASS) to provide better measures of teacher supply and demand and of factors influencing its balance, including teacher salaries, qualifications, and career patterns.

Although concern about teacher shortages has fluctuated since the late 1980s, a number of factors make continued monitoring of teacher supply and demand important. For example, school enrollments continue to increase, the numbers of new college graduates with education degrees are still smaller than in the past (Snyder 1999, p. 326), and the continuing practice in several states of waiving standard teacher credentials when hiring new teachers suggests that some adjustments in teacher qualifications are being made, possibly in response to shortages.

This report presents national estimates of the numbers and proportions of four types of newly hired teachers in both the public and the private sectors. It also examines the basic demographic characteristics, teaching qualifications, career paths, and former occupations of each type of newly hired teacher.

Data Source and Definitions

This report uses data from the 1987–88, 1990–91, and 1993–94 SASS "Teacher Survey," which collected information from public and private school teachers. Specifically, the report analyzes data from those teachers in the SASS sample who indicated that they were newly hired in that state or sector that school year, that they taught half time or more, and that they were regular teachers—that is, neither itinerant teachers (those whose assignment requires them to provide instruction at more than one school) nor long-term substitute teachers.

Model for counting newly hired teachers

Various models can be used to count newly hired teachers. These models differ in the way that they count teachers who have transferred from other schools, districts, states, or sectors (public or private). In other words, which transfers are counted as new hires depends on the model used. For example, a national-level model counts as new hires only those teachers who transferred from outside the country, while a school-level model counts all the teachers who transferred from other schools. This report uses a district-level model to define which transfers to count as newly hired teachers. The model counts all teachers who transferred between public and private schools (i.e., between sectors); all teachers who transferred from one state to another state; and—among teachers who stayed in the same state—those teachers who transferred either from one public school system to another or from one private school to another. The inclusion of some transfers who stayed within both the same state and the same sector marks a departure from previous work by the authors (Rollefson and Broughman 1994 and 1995; Rollefson 1993).

Types of newly hired teachers

In this report, newly hired teachers are classified into four types. Of these four types of new hires, two are experienced teachers and two are first-time teachers.

First-time teachers are either

- *newly prepared teachers*—first-year teachers who were attending college or had earned their highest degree in the previous year; or
- *delayed entrants*—first-year teachers who had engaged in other activities in the year or years

between graduating from college or receiving their highest degree and becoming teachers.

Experienced teachers are either

- *transfers*—teachers who in the previous year were teaching in another school either in the other sector (public or private), in another state, or within the same state and sector but in another school system (for public school teachers) or in another private school (for private school teachers); or
- *reentrants*—teachers who in the previous school year were not teaching elementary or secondary school, but who had taught in the past.

Highlights

In 1993–94, about 2.4 million public and 337,000 private school teachers were teaching half time or more, an increase of 280,000 public and 53,000 private school teachers since 1987–88. Between these two points in time, the percentage of private school teachers who were newly hired remained stable at about 17 to 18 percent, while that for public school teachers increased from 6 to 9 percent. While the percentage of teachers who were newly hired was greater in private than in public schools, the absolute numbers of both newly hired and continuing teachers were greater for public schools than for private schools. This report focuses on the 184,000, 223,000, and 259,000 public and private school teachers who were newly hired in school years 1987–88, 1990–91, and 1993–94, respectively.

Sources of new hires

Between 1987–88 and 1993–94, a shift in sources of newly hired teachers occurred as public school districts and private schools hired relatively more first-time teachers and relatively fewer reentrants (table A). Among the first-time teachers, there was increased hiring of both the newly prepared and delayed entrant groups.

In 1993–94, the proportions of first-time teachers, transfers, and reentrants hired by the public and the private sectors were similar. In both sectors, these three sources of new hires had the same relative importance: first-time teachers were most important, followed by transfers, then by reentrants. Of the two types of first-time teachers, the public sector hired relatively more newly prepared teachers and fewer delayed entrants than the private sector.

Demographic characteristics

Like the public and private school teacher workforces as a whole, newly hired teachers in 1993–94 were predominately female; they were also predominately white, non-Hispanic, although less so than the teacher workforce as a whole (table B). Between 1987–88 and 1993–94, the percentage of newly hired teachers who were minority increased in public and private schools. The percentage of minority newly prepared teachers doubled in the public sector and quadrupled in the private sector, and there were relative increases in the numbers of minority public reentrants and private transfers.

Table A.—Percentage distribution of newly hired public and private school teachers, by supply source: School years 1987–88, 1990–91, and 1993–94

	Public			Private		
Source	1987–88	1990–91	1993–94	1987–88	1990–91	1993–94
Total percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**134,820**	**170,563**	**202,679**	**49,671**	**52,288**	**56,188**
First-time teachers total	30.6	41.7	45.8	25.2	34.0	42.4
Newly prepared	21.3	26.5	29.2	14.1	18.2	21.1
Delayed entrants	9.3	15.3	16.6	11.1	15.9	21.4
Transfers total	36.5	34.3	31.4	38.1	36.1	34.3
Within state and sector	20.8	21.6	20.2	19.0	18.1	14.6
Across state	8.3	7.1	7.1	8.3	7.0	11.5
Across sector	7.5	5.6	4.1	10.8	11.0	8.1
Reentrants total	32.8	24.0	22.9	36.7	29.9	23.3

NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), 1987–88, 1990–91, and 1993–94, "Public School Teacher Questionnaire" and "Private School Teacher Questionnaire." (Originally published as table 2 on p. 5 of the complete report from which this article is excerpted.)

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Table B.—Selected demographic characteristics of newly hired and all public and private school teachers: School year 1993–94

Characteristics	Public		Private	
	New hires	All	New hires	All
Percent female	72.5	72.9	76.7	76.5
Percent minority	16.0	13.7	11.1	7.9
Mean age	33.9	43.1	34.4	41.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), 1987–88, 1990–91, and 1993–94, "Public School Teacher Questionnaire" and "Private School Teacher Questionnaire." (Originally published as table 5 on p. 8 of the complete report from which this article is excerpted.)

Teaching qualifications

In both sectors in 1993–94, delayed entrants were less likely than newly prepared teachers to hold qualifications (major or minor, certification) in their primary field of assignment (figure A). In both sectors, experienced new hires (that is, transfers and reentrants) were very similar to each other and to newly prepared teachers in terms of qualifications.

The percentage of public-sector delayed entrants, transfers, and reentrants holding a major or minor plus certification in the primary field of assignment increased between 1987–88 and 1993–94. In 1987–88, for example, 36 percent of public-sector delayed entrants held a major or minor plus certification in their primary assignment field, compared to 55 percent in 1993–94.

Career paths

In school year 1993–94, many new hires gained access to teaching jobs through substitute teaching positions. Many delayed entrants (36 percent of public and 22 percent of private delayed entrants) were substitute teachers in the previous year, as were 28 percent of public and 18 percent of private reentrants.

Among both delayed entrants and reentrants, working in nonteaching occupations was a major prior-year activity. Over a third of public and almost half of private delayed entrants, and a fourth of public and over a third of private reentrants transferred from nonteaching occupations in 1993–94. Most occupational transfers also are from occupations outside education. Overall, occupational transfers occur more often in the private sector than in the public sector.

Discussion

The relative contributions of different sources of newly hired teachers have changed dramatically over the past 3 decades. After falling sharply between the 1960s and the mid-1980s, for example, the proportion of new hires who were first-time teachers rose between 1987–88 and 1993–94. Whether this shift is supply or demand driven is not clear. For instance, one supply scenario is that the reserve pool of former teachers is shrinking, so that schools must turn increasingly to first-time teachers. An example of a demand scenario is that budget restrictions may push schools to hire the less expensive first-time teachers.*

Hiring of both types of first-time teachers (newly prepared teachers and delayed entrants) increased between 1987–88 and 1993–94. Since the qualifications of the delayed entrants in their primary assignment fields were less than those of newly prepared teachers and experienced teachers, the increased hiring of delayed entrants may indicate an adjustment in teacher qualifications due to supply and demand imbalances.

The data suggest that the two types of first-time teachers were different from one another. In 1993–94, for example, almost half of public and three-fourths of private delayed entrants lacked a major or minor plus certification in their primary assignment field, suggesting that they did not plan to enter the teaching profession when they were earning their highest degrees and that they may be in need of alternative teacher training programs. In both sectors,

*In 1993–94, the differences between average annual base salaries paid to first-time teachers (newly prepared teachers and delayed entrants) compared with experienced teachers (transfers and reentrants) were $4,200 to $5,200 in public and $1,200 to $4,500 in private schools.

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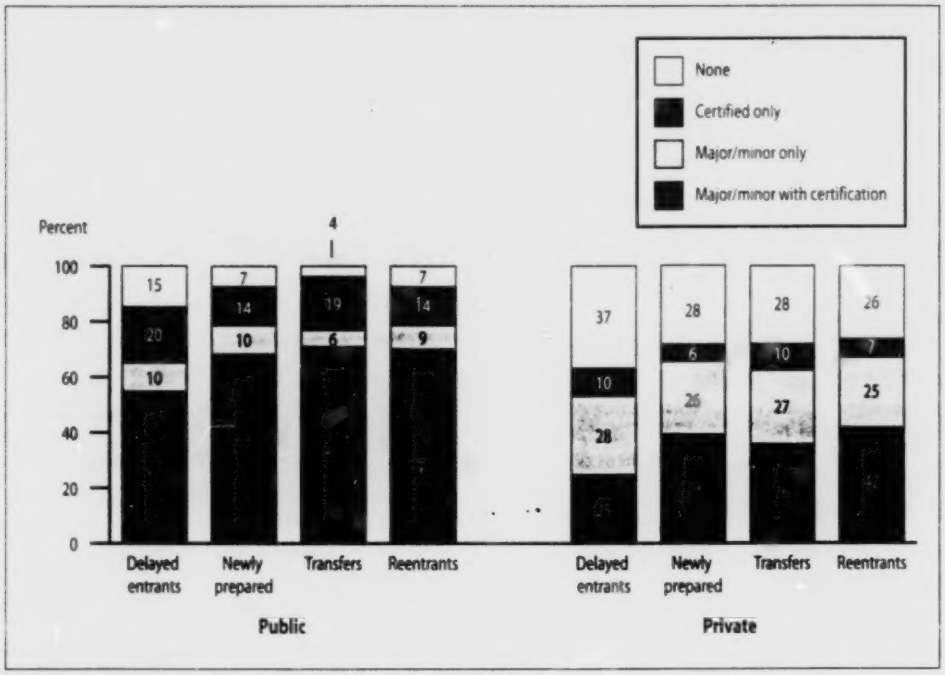
Figure A.—Percentage distribution of newly hired teachers, by sector, supply source, and qualifications in primary assignment field: 1993–94



NOTE: Detail may not add to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), 1987–88, 1990–91, and 1993–94, "Public School Teacher Questionnaire" and "Private School Teacher Questionnaire." (Originally published as figure 3 on p. 12 of the complete report from which this article is excerpted.)

between 13 and 15 percent more newly prepared teachers than delayed entrants held a major or minor plus certification in their primary field.

The two types of experienced teachers, on the other hand, were remarkably similar across all variables examined in this report. The data suggest that reentrants and transfers may, in many cases, represent teachers with the same basic career path, which includes a break in service. According to this scenario, reentrants—who were slightly older than transfers—are at a later stage of their career, namely, after the break in service. However, those reentrants who transferred from nonteaching occupations may not have been following the typical teacher career path.

Continued reporting of data from SASS (collection of the 1999–2000 SASS began in the fall of 1999) will clarify some of the issues raised and verify the nature and magnitude of the apparent trends examined in this report. Since shortages often take the form of decreasing quality of those hired rather than failure to fill vacancies, the issues of teacher supply, demand, and shortage cannot be adequately addressed without better measures of teacher quality (Boe and Gilford 1992). Data on teacher preparation and qualifications, while important, do not directly measure how well a teacher teaches students in the classroom. Improvement in this area requires research to define the dimensions of teacher quality and to develop methods to measure them.

Finally, for policymakers to be able to influence supply and demand balances and for schools to attract and retain the most qualified teachers, a better understanding of the factors that influence individuals' decisions to enter, leave, and return to the teaching profession is needed.

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Data source: The NCES Schools and Staffing Survey (SASS), 1987–88, 1990–91, and 1993–94, "Public School Teacher Questionnaire" and "Private School Teacher Questionnaire."

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Salaries of Teachers

This article was originally published as an Indicator of the Month, taken from* The Condition of Education: 1999. *The sample survey data are from the U.S. Census Bureau's March Current Population Survey (CPS).

Attracting and retaining quality teachers are growing concerns among education officials and the public. This is especially true for beginning teachers as school districts compete with each other and other industries for additional teaching personnel to cope with growing enrollments and an aging workforce of experienced teachers who are nearing retirement. Increased salaries potentially provide a means of attracting and retaining the increased numbers of quality young teachers who will be needed in the years ahead.

- As a wave of younger teachers hired in the mid-1970s has aged, a demographic shift in the age of teachers has occurred. For example, in 1975, 53 percent of all full-time teachers were younger than age 35; in 1993, the percentage of younger teachers fell to about 23 percent (table 1 and figure 1). Meanwhile, the percentage of full-time teachers 45 years old or older increased from about 26 percent in 1975 to 43 percent in 1993.
- The annual median salaries (in constant 1998 dollars) of full-time teachers decreased between 1971 and 1981 by about $500–700 per year, on average, in each age group (table 1 and figure 1).
- Between 1981 and 1989, the salaries of teachers rose. For the oldest group of teachers, salaries rose by about $1,100 per year, on average (in constant 1998 dollars), while for the middle and youngest age groups, salaries increased by smaller amounts.
- Since 1989, the salaries of the oldest and youngest groups of teachers have remained about the same, while the salaries of the middle age group (between ages 35 and 44) have declined by about $400 per year, on average (in constant 1998 dollars).
- The difference between the annual median salaries of all full-time workers with at least a bachelor's degree and all full-time teachers declined from about $5,000 in 1981 to $2,300 in 1998 (in constant 1998 dollars). This decline in the salary gap has been due mainly to increases in the relative size of the older teaching workforce and in the salaries of teachers ages 45 or older.

Data source: U.S. Bureau of the Census, Current Population Survey (CPS), March 1971–98.

For technical information, see

National Center for Education Statistics. (1999). *The Condition of Education: 1999* (NCES 1999–022).

For complete supplemental and standard error tables, see either

- the electronic version of *The Condition of Education: 1999 (http://nces.ed.gov/pubs99/condition99/)*, or
- volume 2 of the printed version: *The Condition of Education: 1999 Supplemental and Standard Error Tables* (NCES 2000–016).

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To obtain this Indicator of the Month (NCES 2000–011), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site *(http://nces.ed.gov)*.

Table 1.—Percentage distribution and annual median salaries (in constant 1998 dollars) of full-time elementary and secondary school teachers, by age, and annual median salaries of all bachelor's degree recipients: 1971–98

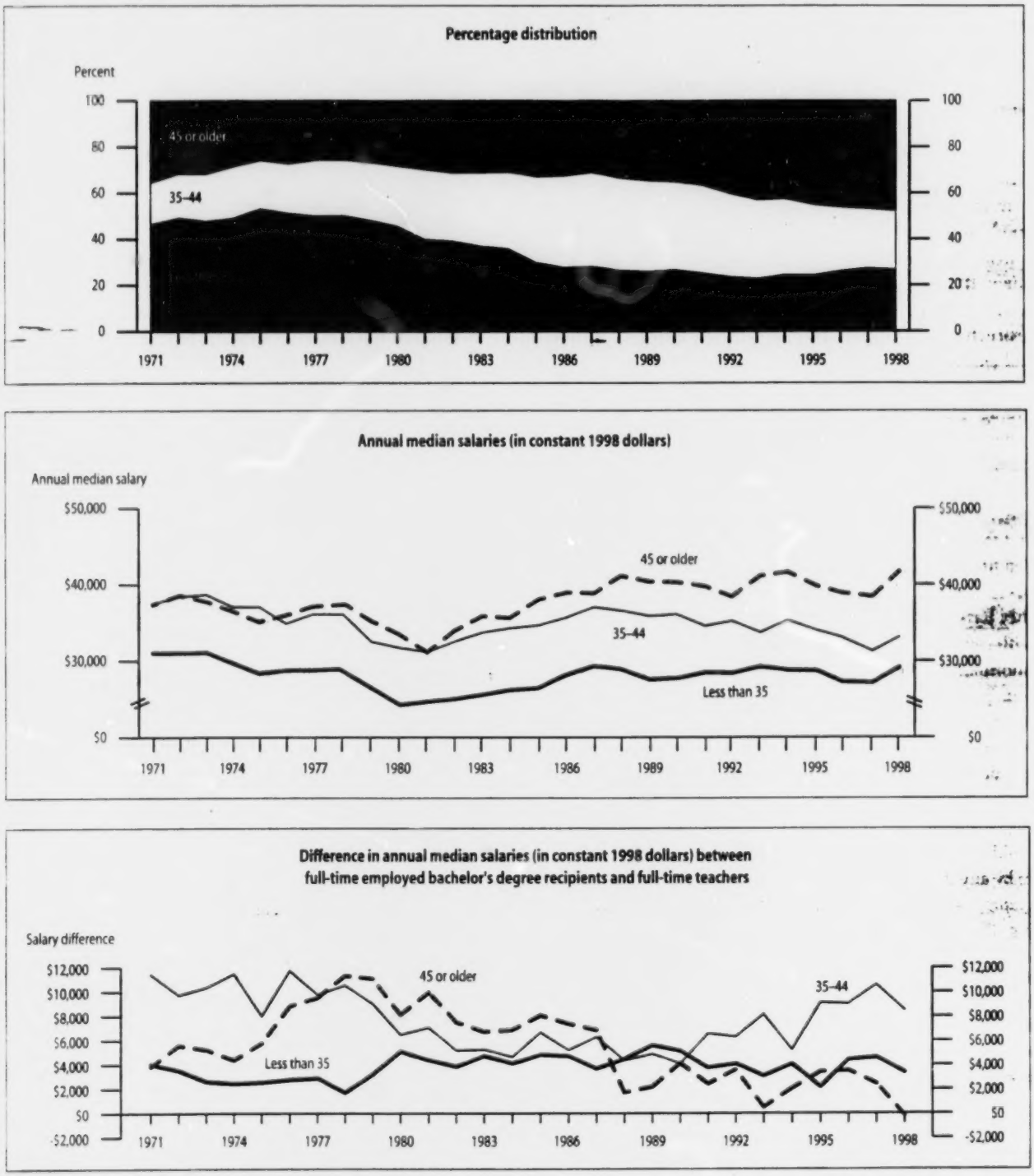
Year	Teachers by age (percent)			Salaries of all teachers	Teachers' salaries by age			Salaries of all bachelor's degree recipients*
	Less than 35	35–44	45 or older		Less than 35	35–44	45 or older	
1971	46.4%	18.1%	35.5%	$34,113	$31,042	$37,522	$37,369	$39,736
1973	47.7	20.6	31.7	34,138	31,102	38,690	37,758	39,740
1975	53.1	21.2	25.7	31,581	28,361	37,070	35,106	35,541
1977	49.9	24.4	25.8	32,003	28,781	36,113	37,135	37,030
1979	48.0	25.2	26.8	30,061	26,899	32,508	35,204	35,283
1981	39.7	30.4	30.0	28,576	24,681	31,169	31,099	33,584
1983	36.8	32.0	31.2	31,122	25,589	33,716	35,867	34,464
1985	29.7	37.3	33.0	33,188	26,453	34,660	38,026	35,954
1987	28.1	40.8	31.2	34,893	29,327	37,039	38,842	37,714
1989	25.8	39.5	34.6	34,668	27,543	35,860	40,341	36,923
1991	25.1	38.2	36.6	34,322	28,477	34,562	39,738	36,924
1993	22.7	34.3	43.0	34,947	29,249	33,716	41,103	36,585
1995	24.2	30.7	45.1	35,134	28,709	33,978	39,759	37,817
1997	27.3	25.8	46.9	32,295	27,121	31,273	38,406	36,740
1998	26.7	25.5	47.8	35,099	29,119	33,105	41,661	37,399

*Includes only full-time employed bachelor's degree recipients.

NOTE: Median salaries refer to the previous calendar year; for example, salaries reported in 1971 refer to salaries earned in 1970. The Consumer Price Index (CPI) was used to calculate constant dollars. Includes full-time public and private school teachers who taught grades 1–12. Detail may not add to 100 due to rounding.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), March 1971–98 (selected years).

Figure 1.—Percentage distribution and annual median salaries of full-time elementary and secondary school teachers, by age: 1971–98



NOTE: Median salaries refer to the previous calendar year; for example, salaries reported in 1971 refer to salaries earned in 1970. The Consumer Price Index (CPI) was used to calculate constant dollars. Includes full-time public and private school teachers who taught grades 1–12.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), March 1971–98.

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In the Middle: Characteristics of Public Schools With a Focus on Middle Schools

Martha Naomi Alt and Susan P. Choy

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The sample survey data are from the NCES Schools and Staffing Survey (SASS) and the Teacher Follow-up Survey (TFS).

Educators, parents, policymakers, and researchers have focused considerable attention on middle-level education in recent years, prompted by widely held concerns about middle schools' academic rigor and the effectiveness of activities designed to help early adolescents develop in nonacademic realms. As a result, many middle school educators have renewed efforts to develop curricula and instructional strategies that challenge students academically and expand their intellectual interests, to ensure that teachers receive appropriate training to meet the needs of this age group, and to create more nurturing and supportive environments.

This report uses data from the Schools and Staffing Survey (SASS), conducted in 1987–88, 1990–91, and 1993–94, and the accompanying Teacher Follow-up Survey (TFS), conducted a year after each administration of SASS, to describe various aspects of middle schools, examine how they have changed over time, and compare middle schools with elementary and secondary schools. These data provide information on fundamental dimensions of school organization, programs and services, decision making and management, staffing matters, instructional practices, and school climate. Only public schools are described; there were too few private middle schools to analyze in the SASS data set.

Definitions and Overview of School Levels

Middle schools include some of the grades from 5 through 8, by any definition; the most common configuration is grades 6–8. This report defines school levels in the following way:[1]

- elementary—schools with at least one grade lower than 5 and no grade higher than 8;
- middle—schools with no grade lower than 5 and no grade higher than 8;
- secondary—schools with no grade lower than 7 and at least one grade higher than 8; and
- combined—schools with at least one grade lower than 7 and at least one grade higher than 8. Schools with only ungraded classes (no grades reported in K–12) were included with combined schools.

[1]Previous publications that use SASS data have generally lacked a category for middle schools and used different definitions of elementary and secondary schools.

In 1993–94, there were 80,740 public schools in the United States, about 15 percent of them middle schools. The number of middle schools increased from 9,086 to 11,712 between 1987–88 and 1993–94, while the number of elementary and secondary schools remained about the same (figure A). The growth occurred almost solely in schools with grades 6–8. Of some 41.6 million students in public schools in 1993–94, 6.8 million were enrolled in middle schools.

Organization of Schooling

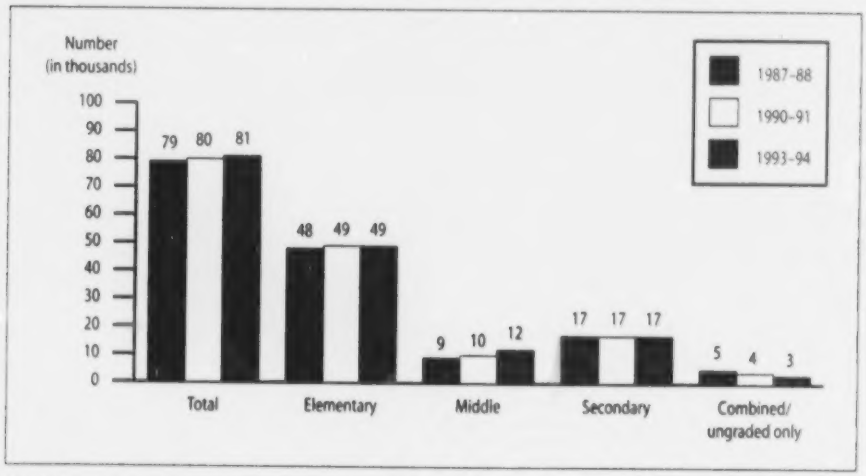
The self-contained class structure, the norm in elementary schools, allows teachers to track their students' progress closely and provides a consistent classroom environment for young students.

Secondary schools, on the other hand, are usually organized in departments in order to provide teachers who have in-depth subject-specific training and certification and to allow students some choice among courses. Middle school reformers have searched for creative ways to combine the advantages of both approaches. In practice, middle schools (like secondary schools) most often have departmentalized classes: 79 percent of middle school teachers and 92 percent of secondary school teachers taught in departments in 1993–94 (figure B). In contrast, 79 percent of elementary school teachers had self-contained classes. Many of the ways in which middle schools resemble secondary schools and differ from elementary schools flow from the way that classes and teachers are organized.

Decision Making and Management

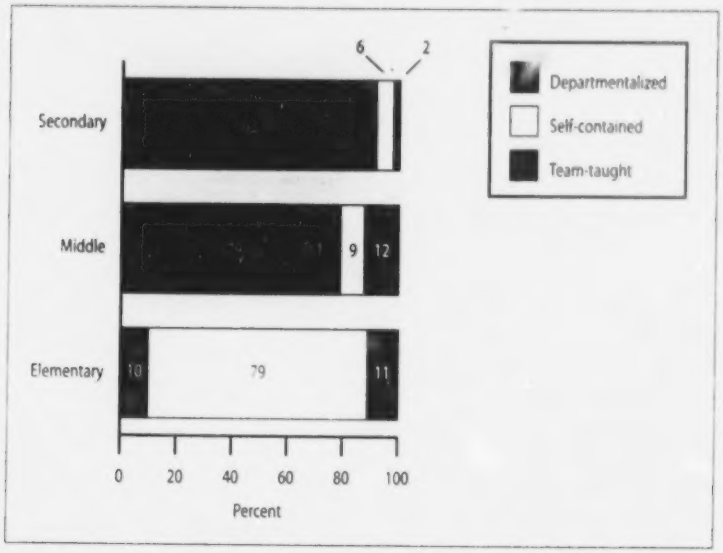
For some basic issues of school management, principals' perceptions of their influence either did not differ or differed only slightly by school level in 1993–94. High proportions of principals reported having a lot of influence on evaluating teachers' performance (about 95 percent at each level), hiring full-time teachers and setting discipline policy (about 80–90 percent), and determining the content of inservice training programs (70–75 percent). At least 50 percent of principals at each level reported that they had a lot of influence on establishing curriculum.

Figure A.—Number of public schools of different levels: 1987–88, 1990–91, and 1993–94



SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), 1987–88, 1990–91, and 1993–94, "Public School Questionnaire."

Figure B.—Percentage of public school teachers with different types of classes, by school level: 1993–94



SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), 1993–94, "Public School Teacher Questionnaire."

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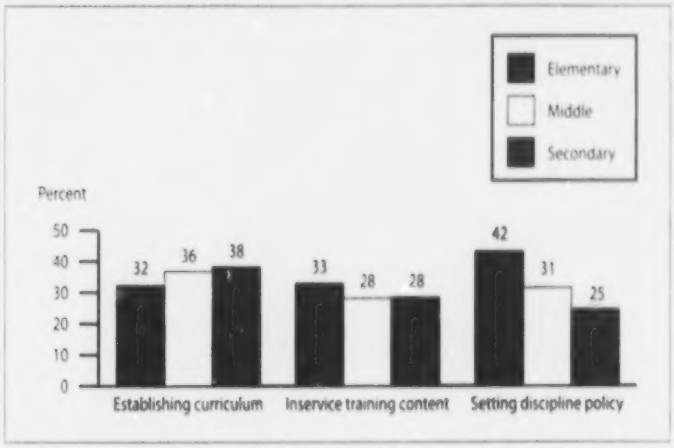
Figure C.—Percentage of public school teachers who reported that they had a lot of influence* over establishing curriculum, determining content of inservice training, and setting discipline policy, by school level: 1993–94



*Ratings of influence are counted as "a lot" if respondents marked one of the highest two numbers (5 or 6) on a 6-point scale.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), 1993–94, "Public School Questionnaire" and "Public School Teacher Questionnaire."

Teachers as well as principals were asked to rate their influence over a range of school policies and practices. In 1993–94, at least 25–30 percent of teachers at each level reported that they had a lot of influence in three areas: setting discipline policy, establishing curriculum, and determining the content of inservice training (figure C). In the area of setting discipline policy, the percentage of teachers who thought that they had a lot of influence decreased notably as school level increased (from 42 percent of teachers at elementary schools to 31 percent at middle schools and 25 percent at secondary schools). For establishing curriculum, teachers' estimates of their influence increased somewhat with school level.

School Staff

Teachers' certification status

One policy concern is that middle school teachers may be less prepared than secondary school teachers to teach subject-specific classes, and certification data from the 1993–94 SASS provide at least limited support for this concern. Middle school teachers were slightly less likely than elementary or secondary school teachers to have regular/alternative certification[1] in their main field, the field in which they taught the most classes (72 percent vs. 78 percent and 76 percent, respectively). Lack of certification is a particular concern for teachers who teach a core academic subject. Of departmentalized middle school teachers whose main assignment was mathematics, science, English, or social studies, approximately 7 to 8 percent lacked certification in that field in 1993–94. In contrast, 2 to 3 percent of such secondary school teachers lacked certification in their core field.

Teachers' education, experience, and professional development activities

The likelihood that a teacher had attained a master's or other advanced degree increased somewhat with school level in 1993–94. Also, a slightly higher percentage of teachers with 3 or fewer years of experience were teaching at middle schools than at elementary or secondary schools (the increase in new middle schools may partly explain this finding). On three of five topics included in the survey (in-depth study in their subject, teaching methods in their field, and student assessment), teachers were less likely to participate in training as school level increased. Overall, elementary school teachers were most likely to agree with several positive statements about this professional development training, middle school teachers somewhat less, and secondary school teachers were the least likely to agree.

[1]Teachers reported the type of certification that they had: advanced; regular or alternative; provisional, probationary, temporary, or emergency; or none.

Handling teaching vacancies

Roughly one-third of middle and secondary schools reported that they had great difficulty filling a teaching vacancy, or could not fill it, in 1993–94—about twice the proportion as that for elementary schools. Because schools at the two higher levels are mainly departmentalized, the pool of applicants for many openings is limited to those who have specialized preparation in a particular subject, as well as appropriate school-level credentials if required.

Teacher retention, mobility, and attrition

Generally, 80–90 percent of teachers surveyed in 1993–94 remained at the same school the following school year, with a slightly lower percentage for those at middle schools. Similarly, middle school teachers were slightly more likely to move to a different school within 1 year than teachers at the secondary level. However, these patterns were not found in earlier SASS data. From 1987–88 to 1993–94, teachers at middle schools became somewhat more likely to leave teaching within 1 year (4 percent in the former year vs. 8 percent in the latter), yet comparable changes did not occur at the elementary or secondary levels.

School Climate

Teachers' evaluations of their school's climate and operations

Teachers were asked in SASS to express their degree of agreement with a broad range of statements about their school's climate, including aspects related to the principal, students, colleagues, and school conditions. The percentage of teachers agreeing with positive statements tended to decrease as school level increased, while the percentage agreeing with negative statements increased with level. Despite high rates of teacher agreement overall with the following positive statements, for example, teachers at the higher levels were less likely to agree that teachers participate in most of the important educational decisions, that they receive a great deal of parental support, that the administration's behavior is supportive and encouraging, that they try to coordinate course content with colleagues, and that the principal makes expectations for staff clear. Complementing this pattern, for the following three negative statements, teachers' likelihood of agreeing increased with level: that the principal does a poor job of getting resources (fewer than 20 percent at any school level); that they sometimes have to follow rules that conflict with their best professional judgment; and that they sometimes feel it is a waste of time to do their best as a teacher (in the range of roughly 20 to 30 percent for the latter two statements).

Teacher satisfaction

In 1994–95, at least 77 percent of teachers at each of the school levels reported that they were satisfied[3] with their job overall, with higher rates of satisfaction reported by elementary school teachers. Similar proportions of elementary, middle, and secondary school teachers reported satisfaction with their salary, opportunity for advancement, and support/recognition from administrators. However, teacher satisfaction with other aspects of their jobs varied with level. The percentage of teachers who were satisfied with two aspects of their jobs decreased as school level increased: the caliber of their colleagues and the availability of resources, materials, and equipment. Middle and secondary school teachers reported lower rates of satisfaction with the intellectual challenge of their job than did teachers at elementary schools. In contrast, middle and secondary school teachers were more satisfied than elementary school teachers with their teaching load.

Teachers' and principals' ratings of problems

Teachers and principals were asked to rate a number of possible problems at their school as serious, moderate, minor, or not a problem. In 1993–94, the percentage of teachers and principals who considered many of these problems serious increased with school level. This was true for student apathy, students' arriving unprepared to learn, the lack of academic challenge, the lack of parent involvement, robbery/theft, and student alcohol use. Middle school teachers were the most likely to report physical conflicts among students as a problem (11 percent), though it was not a particularly widespread problem. Student disrespect for teachers was cited by approximately twice the percentage of teachers at middle and secondary schools as at elementary schools. Principals were less likely than teachers to view each problem as serious, except for poverty.[4] This was true for middle schools but also for all schools as a

[3] Job satisfaction was analyzed only for teachers who remained at the same job 1 year after the SASS data were collected. This restriction was necessary because school level was known only for that group. However, it should be pointed out that these data are likely to overstate satisfaction rates, because teachers who leave teaching (and perhaps also those who change schools) probably tend to be less satisfied than those who stay at the same job.

[4] These discrepancies between teachers' and principals' opinions were noted in an earlier report (Henke et al. 1996, p. 103).

group. This discrepancy may result partly because teachers have more direct contact and interaction with students each day and with a larger number of students, compared with principals.

Conclusion

Across the issues examined here with SASS and TFS data, middle schools rarely differed dramatically from elementary or secondary schools. It is possible that with data on other topics, particularly certain qualitative measures, middle schools would stand out more from other schools. Middle schools focus on serving the needs of young adolescents but otherwise share many of the same conditions, constraints, goals, and strengths of other schools. As they open new middle schools and reform existing ones, educators strive to adapt what works well at other levels to a school environment shaped for young adolescents. The overarching similarities across school levels that result should come as no surprise. Where middle and secondary schools share characteristics and differ from elementary schools, the development of middle schools along the secondary school model may provide some explanation. For other patterns, related variables such as school size may be relevant.

Five patterns characterize the data on middle schools vis-a-vis other schools. In the first, which occurred with some frequency, middle and secondary schools shared characteristics but differed from elementary schools. For example, a substantial majority of teachers in both middle and secondary schools teach in departmentalized settings. Middle and secondary school teachers generally have more specialized training in one or more subjects compared with elementary teachers. Middle and secondary schools were about twice as likely as elementary schools to report great difficulty filling teaching vacancies, perhaps partly because the requirements for teaching many of the subjects are more specific.

In the second pattern, middle schools are more similar to elementary than to secondary schools. Because elementary and middle schools tend to organize their classes differently, this pattern of similarity is relatively rare. Among these occurrences, middle and elementary school teachers were more likely to team teach their classes than teachers at the secondary level. Principals provide another example: at the lower two school levels, they viewed student absenteeism and alcohol use as much less widespread problems than at secondary schools.

In the third pattern, appearing with quite a few aspects of schooling, a fairly steady increase or decrease occurred in the prevalence of characteristics by school level. For example, for inservice programs on teaching methods, in-depth study of their subject, and student assessment methods, teachers were less likely to participate in training as school level increased. The proportion of teachers who thought they had a lot of influence on setting discipline policy decreased notably as school level increased, while their perceived influence on establishing curriculum increased with school level. The percentage of teachers who agreed with many negative statements about their school's climate and management (and who disagreed with several positive statements) or who viewed numerous school problems as serious increased with level.

In the fourth pattern, when middle schools stood out as the exception from both elementary and secondary schools, such differences tended to be small. For example, middle school teachers were slightly less likely than teachers at other school levels to have regular or alternative certification in their main assignment field. As an illustration, departmentalized middle school teachers of mathematics, science, English, and social studies were more likely than their secondary school counterparts to lack certification in that field. Middle school teachers were also slightly less likely than those at other levels to remain teaching at the same school the following year. Teachers were more likely to report that two problems—physical conflicts among students and student disrespect for teachers—were serious at middle schools than at the other two levels.

Finally, in some areas, particularly those related to provision of services and school management, there were no differences between the various school levels. For example, more than 90 percent of schools at each level provided programs to prevent drug and alcohol use among students, and nearly all schools had a library media specialist on staff. Similarly, principals at each school level were equally likely to think that they had a lot of influence over evaluating teachers' performance and determining the content of inservice training programs. Teachers reported similar rates of satisfaction with their opportunity for advancement, their salary, and the school administration's support and recognition.

Future Research

The questionnaires for the upcoming 1999–2000 SASS (and 2000–01 Teacher Follow-up Survey) include most of the items used in the earlier questionnaires. Once these data become available, many of the aspects of schooling discussed here can be examined over a 12-year period. The upcoming surveys also include new items that address additional policy issues that have come to the fore more

recently. New or expanded topics in the 1999–2000 SASS that may provide information relevant to middle-level education include the uses of schoolwide performance reports; tracking progress on school improvement plans; professional development and new-teacher preparation and support in the school; ability-based tracking and grouping within classes; parent involvement; charter schools; and the use of computers and other technology in the school. These new SASS data, which are planned for release in 2001, will provide opportunities for a range of additional comparative analyses among elementary, middle, and secondary schools.

Reference

Henke, R.R., Choy, S.P., Geis, S., and Broughman, S.P. (1996). *Schools and Staffing in the United States: A Statistical Profile, 1993–94* (NCES 96–124). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Data sources: The NCES Schools and Staffing Survey (SASS), 1987–88, 1990–91, and 1993–94; and Teacher Follow-up Survey (TFS), 1988–89, 1991–92, and 1994–95.

For technical information, see the complete report:

Alt, M.N., and Choy, S.P. (2000). *In the Middle: Characteristics of Public Schools With a Focus on Middle Schools* (NCES 2000–312).

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To obtain the complete report (NCES 2000–312), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov)*, or contact GPO (202–512–1800).

Condition of America's Public School Facilities: 1999

Laurie Lewis, Kyle Snow, Elizabeth Farris, Becky Smerdon, Stephanie Cronen, and Jessica Kaplan

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The sample survey data are from the "Condition of Public School Facilities" survey, conducted through the NCES Fast Response Survey System (FRSS).

Background

Over the past decade, the physical condition of America's public schools has received considerable attention (e.g., Kozol 1991; Lewis et al. 1989). For example, a number of lawsuits challenging school funding for facilities have drawn attention to the poor conditions that many students encounter at school (e.g., *Roosevelt Elementary School No. 66 v. Bishop*, 877 P. 2d 806 [Ariz. 1994]). Newspaper stories and research studies describing poor ventilation, broken plumbing, and overcrowding have raised concerns about the effects of school facilities on teaching and learning. More importantly, some conditions, like sagging roofs or poor air quality, have raised serious questions about student and teacher safety.

The physical condition of schools is described in a series of reports based on a 1994 study conducted by the U.S. General Accounting Office (GAO). In addition, several studies have reported on school repair and construction costs, each with a somewhat different focus. The 1994 GAO study provided estimates of the cost of repairs, renovations, and modernizations to put schools into good overall condition (U.S. GAO 1995), while a more recent GAO study reported actual school construction expenditures for fiscal years 1990 through 1997 (U.S. GAO 2000). Another report included actual costs of completed school construction projects in 1998 and projected expenditures for new construction, additions, and renovations for 1999 (Abramson 1999). A report recently released by the National Education Association (NEA) gave a cost estimate of the funds needed for various kinds of school infrastructure (including new construction) and education technology (NEA 2000).

This report provides national data about the condition of public schools in 1999 based on a survey conducted by the National Center for Education Statistics (NCES) using its Fast Response Survey System (FRSS). Specifically, this report provides information about the condition of school facilities and the costs to bring them into good condition; school plans for repairs, renovations, and replacements; the age of public schools; and overcrowding and practices used to address overcrowding. The results presented in this report are based on questionnaire data for 903 public elementary and secondary schools in the United States. The responses were weighted to produce national estimates that represent all regular public schools in the United States. Information about the condition of school facilities is based on questionnaire rating scales rather than on physical observation of school conditions by outside observers.

Key Findings

Estimates of cost to put buildings into good condition

A major barrier to schools' improving their facilities is the substantial cost (U.S. GAO 1995). If schools are unable to obtain the funding they need to perform maintenance or construct new buildings when necessary, facilities problems multiply, which can result not only in health and safety problems, but also in increased costs of repairs (Hansen 1992). Results of the 1999 FRSS survey indicate that:

- Three-quarters of schools reported needing to spend some money on repairs, renovations, and modernizations to put the school's onsite buildings into good overall condition.[1] The total amount needed by schools was estimated to be approximately $127 billion.
- The average dollar amount per school for schools needing to spend money was about $2.2 million. The average cost per student of repairs, renovations, and modernizations to put the school into good overall condition among the schools that reported needing to spend money was $3,800.

Types of school buildings and overall facilities conditions

Observations of school facilities have appeared in headlines, speeches, and reports that focus on the deteriorating environmental and physical conditions of the nation's schools. Results of the 1999 FRSS survey confirm that although most schools are in relatively good condition, many schools are in less than adequate condition:

[1] Schools that reported on the questionnaire that the condition of any type of onsite school building (original and temporary buildings, permanent additions) *or any building feature* (e.g., roofs, plumbing, electric power) was less than good (i.e., any type of building or building feature was given a rating of adequate, fair, poor, or replace) provided information about the cost of the needed repairs, renovations, and modernizations. This is somewhat different from the approach used by GAO in 1994, which prevents direct comparison of the cost estimates between the FRSS and GAO studies.

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Table A.—Number and percentage distributions of public schools and enrollments according to the condition of all onsite building types: 1999

Condition of all onsite building types	Schools		Students	
	Percentage distribution	Number	Percentage distribution	Number
All public schools	100	78,300	100	45,000,000
Schools with all building types in adequate or better condition[1]	76	59,500	76	34,000,000
Schools with at least one type of building in less than adequate condition[2]	24	18,700	24	11,000,000

[1]Ratings of adequate or better encompass the ratings of excellent, good, and adequate.

[2]Ratings of less than adequate encompass the ratings of fair, poor, and replace.

NOTE: Percentages are computed within each column and are computed on unrounded numbers. The numbers of schools have been rounded to the nearest hundred, and the numbers of students have been rounded to the nearest million. Detail may not add to totals due to rounding. The condition of all onsite building types is computed across original buildings, permanent additions, and temporary buildings.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Condition of Public School Facilities" survey, FRSS 73, 1999. (Originally published as table 3 on p. 13 of the complete report from which this article is excerpted.)

- One in four schools reported that at least one type of onsite building (i.e., original and temporary buildings, permanent additions) was in less than adequate condition[2] (table A).
- Approximately 11 million students were enrolled in schools reporting at least one type of onsite building in less than adequate condition (table A). Of those students, about 3.5 million attended schools where at least one type of building was in poor condition or needed to be replaced because it was nonoperational or showed significantly substandard performance.
- Eighty-one percent of schools reported that their original buildings were in adequate or better condition, 84 percent of those schools with permanent additions reported them to be in adequate or better condition, and 81 percent of schools with temporary buildings reported them to be in adequate or better condition (table B). This means that approximately one in five schools having buildings of a particular type reported that these building types were in less than adequate condition. This included 4 to 6 percent reporting buildings in poor condition (defined as consistent substandard performance) and 1 to 2 percent reporting that buildings needed to be replaced due to significantly substandard performance or nonoperational condition.
- The condition of original buildings and temporary structures did not vary significantly by school characteristics;[3] however, the condition of permanent additions varied by concentration of poverty: schools with the highest concentration of poverty (defined here as 70 percent or more of the students eligible for free or reduced-price lunch) were more likely to report that their permanent additions were in less than adequate condition than were schools with 20 to 39 percent or schools with less than 20 percent of their students eligible for free or reduced-price lunch (30 percent vs. 13 percent and 8 percent, respectively).

Condition of building features

The 1999 FRSS survey on the condition of public school facilities also collected information on the condition of nine different building features: roofs; framing, floors, and foundations; exterior walls, finishes, windows, and doors; interior finishes and trim; plumbing; heating, ventilation, and air conditioning; electric power; electrical lighting; and life safety features. The 1999 FRSS survey found that:

- Fifty percent of schools reported that at least one of the nine building features at their school was in less than adequate condition, and three-quarters of those schools

[2]This is based on types of onsite buildings, and does not include building features. It is also based on ratings of less than adequate condition, which includes the ratings of fair, poor, and replace.

[3]The school characteristics used as analysis variables in this report are school instructional level, school enrollment size, locale (central city, urban fringe/large town, rural/small town), region, percent minority enrollment, and percent of students in the school eligible for free or reduced-price school lunch (which indicates the concentration of poverty in the school). Throughout this report, differences (particularly those by school characteristics) that may appear large may not be statistically significant. This is due in part to the relatively large standard errors surrounding the estimates (because of the small sample size) and the use of the Bonferroni adjustment to control for multiple comparisons.

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Table B.—Percent of public schools with each type of building, and the percentage distribution of ratings of the overall condition of the building types: 1999

Type of building	School has building type	Overall condition[1]							
		Adequate or better				Less than adequate			
		Total	Excellent	Good	Adequate	Total	Fair	Poor	Replace
Original buildings	[2]100	81	16	38	26	19	13	5	2
Permanent additions	67	84	24	36	24	16	11	4	[3]1
Temporary buildings	39	81	11	37	33	19	12	6	1

[1]Based on schools with that type of building.

[2]Rounds to 100 percent for presentation in the table.

[3]Coefficient of variation greater than 50 percent.

NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Condition of Public School Facilities" survey, FRSS 73, 1999. (Originally published as table 1 on p. 10 of the complete report from which this article is excerpted.)

had more than one building feature in less than adequate condition. Schools in central cities were more likely than schools in urban fringe areas and large towns to report at least one building feature as less than adequate (56 percent compared with 44 percent). Schools with the highest concentration of poverty (70 percent or more of the students eligible for free or reduced-price lunch) were more likely to report that at least one building feature was in less than adequate condition than were schools with 20 to 39 percent or schools with less than 20 percent of their students eligible for free or reduced-price lunch (63 percent vs. 45 percent each).

- Approximately one-fifth of schools indicated less than adequate conditions for life safety features, roofs, and electric power, and about one-quarter of schools reported less than adequate conditions for plumbing and for exterior walls, finishes, windows, and doors. Heating, ventilation, and air conditioning systems were reported to be in less than adequate condition at 29 percent of schools.

Environmental conditions

Environmental conditions, such as heating, ventilation, and air conditioning, are important aspects of the day-to-day environment for students. The 1999 FRSS survey on the condition of public school facilities also collected information on satisfaction with six different environmental conditions: lighting, heating, ventilation, indoor air quality, acoustics or noise control, and physical security of buildings.[4] The results of the 1999 FRSS survey indicate that:

- Forty-three percent of schools reported that at least one of the six environmental conditions was unsatisfactory, and approximately two-thirds of those schools had more than one environmental condition that was unsatisfactory. Ventilation was the environmental condition most likely to be perceived as unsatisfactory (26 percent of schools). Each of the following environmental conditions was rated as unsatisfactory by about one-fifth of schools: heating, indoor air quality, acoustics or noise control, and the physical security of buildings. Twelve percent of schools reported unsatisfactory lighting conditions.
- Schools in rural areas and small towns were more likely than schools in urban fringe areas and large towns to report that at least one of the six environmental conditions was unsatisfactory (47 percent compared with 37 percent). Schools with the highest concentration of poverty were more likely to report at least one unsatisfactory environmental condition than were schools with the lowest concentration of poverty (55 percent compared with 38 percent).
- About one-third of schools reported unsatisfactory energy efficiency, and 38 percent reported unsatisfactory flexibility of instructional space.

Plans for repairs, renovation, or replacement

The condition of school facilities is continuously changing, and information about schools' future plans—in particular, plans for building or installing new structures or additions, as well as making major repairs, renovations, or replacements, in the next 2 years—may provide insights into the future condition of these facilities. The 1999 FRSS survey found that:

[4]In addition, the survey asked about two other conditions—energy efficiency and flexibility of instructional space—which are discussed separately in this report.

- About two-thirds of public schools had written long-range facilities plans to guide their planning for facilities improvements.
- One-fifth of schools reported plans to build new attached and/or detached permanent additions in the next 2 years, and 1 in 10 reported plans to install new temporary buildings in the next 2 years.
- About half of the schools planned to make major repairs, renovations, or replacements to at least one building feature in the next 2 years. Overall, 41 percent of schools indicated plans to make major repairs or renovations to at least one building feature, and one-quarter planned to replace at least one building feature in the next 2 years.
- Schools in less than adequate condition were more likely to have plans for repairs, renovations, or replacement. While 46 percent of schools in adequate or better overall condition reported plans to repair, renovate, or replace at least one building feature in the next 2 years, 67 percent of schools in less than adequate condition reported such plans.

Functional age of schools and school conditions

A number of reports have raised concerns about the age of America's public schools (e.g., Rowand 1999). Because age of the building, by itself, may be somewhat less important than its history of maintenance and renovation, a more accurate indication of a school's age is its functional age. Functional age is defined as the age of the school based on the year of the most recent renovation or the year of construction of the main instructional building(s) if no renovation has occurred. Results of the 1999 FRSS survey indicate that:

- In 1999, the average age of the main instructional building(s) of public schools was 40 years, based on years since original construction. Among schools that had been renovated since construction, the renovation, on average, occurred 11 years ago.
- The average functional age of schools, based on the year of the most recent renovation or the year of construction if no renovation had occurred, was calculated to be 16 years. In general, average functional age did not vary by school characteristics, although small schools were functionally older than medium or large schools.[5]
- The functional age of schools was found to be related to their condition, with older schools more likely than newer schools to report less than adequate or unsatisfactory conditions.

Overcrowding

Dramatic increases in enrollment due to the "baby boom echo," immigration, and migration have led many schools to enroll far more students than they were designed to accommodate.[6] Compounding these conditions are initiatives to reduce class size, resulting in the need for even more classrooms. As the public school system copes with such conditions, there is growing concern about the degree of overcrowding that may exist in some schools. This report provides information about the extent to which public schools are overcrowded, at capacity, or underenrolled.[7] Schools with enrollments more than 5 percent above the capacity of their permanent instructional buildings and space were defined as overcrowded (i.e., overenrolled), schools with enrollments within 5 percent of the capacity of their permanent buildings and space were considered to be at capacity, and schools with enrollments more than 5 percent below the capacity of their permanent buildings and space were considered underenrolled. The 1999 FRSS survey indicates that:

- Overall, about half of public schools were underenrolled, about one-quarter were within 5 percent of their capacity, and about one-quarter were overcrowded, based on the capacity of their permanent instructional buildings and space.
- Large schools were more likely than other schools to be seriously overcrowded (more than 25 percent overenrolled), while small schools were more likely than other schools to be severely underenrolled. Schools with a high minority enrollment (more than 50 percent) were more likely than schools with a low minority enrollment (5 percent or less) to be seriously overcrowded.
- Schools that were classified as overcrowded were more likely than other schools to report that at least one type of onsite building was in less than adequate

[5]Large schools have 600 or more students, medium schools 300 to 599 students, and small schools less than 300 students.

[6]Migration patterns (e.g., families moving out of particular areas) and decisions families make with regard to their children's schooling (e.g., private school enrollment) may also lead to a *decline* in enrollments among some public schools. These declines may result in schools that are *underenrolled*.

[7]The proportion indicating the degree to which enrollment exceeds or falls below the capacity of the permanent buildings and instructional space was calculated using the following formula:

X = [(total student enrollment) – (capacity of permanent instructional buildings and space)] / (capacity of permanent instructional buildings and space).

condition. Overcrowded schools were also more likely than other schools to have at least one building feature that was in less than adequate condition and to have at least one environmental condition that was unsatisfactory.

- About one-third (36 percent) of schools indicated that they used portable classrooms, and 20 percent reported using temporary instructional space. Among these schools, most reported using portables and temporary instructional space to alleviate overcrowding.

Conclusions

Although the majority of America's public schools are in adequate or better condition, a sizable minority are not. About one-quarter of the schools reported that at least one type of onsite building was in less than adequate condition, half reported that at least one building feature was in less than adequate condition, and about 4 out of 10 reported at least one unsatisfactory environmental condition. Data about the functional age of schools suggest that the oldest schools are most in need of attention, but that many of these schools do not have plans for improvement. About three-quarters of public schools do not have problems with overcrowding, but close to 10 percent have enrollments that are more than 25 percent greater than the capacity of their permanent buildings. Collectively, these data provide a complex portrait of the current physical conditions and crowding in America's public schools. Although the majority of schools are in adequate condition, functionally young, and not overcrowded, a substantial number of schools are in poor condition, and some of them suffer from age and overcrowding. Past experience suggests that correcting these problems will be costly.

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Data source: The NCES Fast Response Survey System, "Condition of Public School Facilities" survey, FRSS 73, 1999.

For technical information, see the complete report:

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To obtain the complete report (NCES 2000–032), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site (*http://nces.ed.gov*).

Characteristics of the 100 Largest Public Elementary and Secondary School Districts in the United States: 1998–1999

Beth Aronstamm Young

This article was originally published as the Discussion in the Statistical Analysis Report of the same name. The universe data are from the NCES Common Core of Data (CCD).

Introduction

This publication provides basic descriptive information about the 100 largest school districts (ranked by student membership) in the United States, Bureau of Indian Affairs, Department of Defense (overseas) schools, and outlying areas (American Samoa, Guam, the Northern Marianas, Puerto Rico, and the Virgin Islands). For the sake of simplicity, when discussing characteristics, the term "nation" (or "United States") is used to refer to all 50 states, the District of Columbia, Bureau of Indian Affairs, Department of Defense (overseas) schools, and outlying areas. This is different from most National Center for Education Statistics (NCES) reports, which only include the 50 states and the District of Columbia in the U.S. totals. Almost one in every four public school students in this nation is served by one of these 100 districts. They are distinguished from smaller districts by characteristics in addition to sheer size, such as average and median school size, pupil/teacher ratios, number of high school graduates, number of pupils receiving special education services, and minority enrollment as a proportion of total enrollment.

The tables in this publication provide information about the characteristics cited above. To establish a context for the information on the 100 largest districts, national school district data are also included, as are basic data on the 500 largest school districts.

Overview of the 100 Largest School Districts

In the 1998–99 school year, there were 16,542 public school districts, over 92,000 schools, and 47.4 million students in public education in the United States and its outlying areas (table A). There were 2.9 million full-time-equivalent (FTE) teachers in the 1998–99 school year and 2.5 million high school graduates in the 1997–98 school year. The 100 largest school districts made up less than 1 percent of all public school districts but served 23 percent of all public elementary and secondary school students.

The 100 largest school districts represent 17 percent of schools and employ 21 percent of all teachers. The 500 largest districts make up 3 percent of all school districts and serve 20.2 million students, or 43 percent of the total public elementary and secondary school student population in the United States.

All of the 100 largest school districts have at least 45,000 students, and 25 of these school districts have over 100,000 students (table B). The largest school district in the country is the New York City Public Schools, with 1,072,628 students enrolled in 1,162 schools. (The New York City Public Schools district is so large it has more students than the 6th through 10th largest school districts added together.) The second largest school district is the Los Angeles Unified, with 695,885 students in 650 schools. The New York City and Los Angeles Unified school districts each have more students than 27 individual states, each of the five outlying areas, the Bureau of Indian Affairs, and the Department of Defense (overseas) schools.[1]

Ninety-two of the 100 largest districts reported staff by type. In 88 of those districts, 45 percent or more of their staff were teachers, and in 4 of these districts over 60 percent were teachers. At the national level, 52 percent of staff were teachers.[1] Only 16 of the 92 districts that reported staff by type had over 1 percent of their staff assigned to district administration.

Where Are the 100 Largest School Districts?

The District of Columbia, Hawaii, and Puerto Rico each have only one school district for the entire jurisdiction, and each is represented among the 100 largest school districts (table B). There are 34 states and jurisdictions that contain at least one of the 100 largest school districts. Two states, Florida and Texas, each have 14 districts among the 100 largest; California has 11. Only a few other states have more than one district represented in the 100 largest: Georgia and Maryland each have 5; Louisiana, North Carolina, Tennessee, Utah, and Virginia each have 4; Ohio has 3; and Arizona, Colorado, Minnesota, Nevada, and New York have 2. The following states each have one school district among the 100 largest: Alabama, Alaska, Illinois, Kansas, Kentucky, Massachusetts, Michigan, Missouri, Nebraska, New Mexico,

[1]State enrollment and staff data can be found in *Public School Student, Staff, and Graduate Counts by State: School Year 1998–99* (Bairu 2000). The national staff ratio does not include Bureau of Indian Affairs schools.

Table A.—Selected statistics for the nation, the 100 largest, and the 500 largest school districts: School year 1998–99

	National total*	100 largest districts*		500 largest districts*	
		Total	Percentage of national total	Total	Percentage of national total
Districts	16,542	100	0.6	500	3.0
Schools	92,883	15,412	16.6	29,433	31.7
Students	47,354,912	10,857,943	22.9	20,200,284	42.7
Full-time-equivalent (FTE) teachers	2,875,045	593,277	20.6	1,110,733	38.6
Graduates (1997–98)	2,544,291	479,632	18.9	949,970	37.3
Pupil/teacher ratio	16.5	18.3	—	18.2	—
Average school size	509.8	704.5	—	686.3	—
Graduates as percentage of all students	5.4	4.4	—	4.7	—

— Not applicable.

*Includes outlying areas, Bureau of Indian Affairs, and Department of Defense (overseas) schools. The 500 largest school districts include 25 school districts that are some other configuration besides PK or K–12; all of the 100 largest school districts are PK or K–12.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Local Education Agency Universe Survey" and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1998–99.

Oregon, Pennsylvania, South Carolina, Washington, and Wisconsin.

As expected, these 100 largest districts tend to be in cities and counties having large populations, with administrative offices typically located in large cities and their environs. Many of the districts are in states where the school districts have the same boundaries as counties. Over 70 percent of these districts are located in coastal and gulf coast states.

How Do These Districts Compare With the Average School District?

General characteristics

By definition, the 100 largest school districts are large, and when compared to the membership distribution of all school districts, they are considerably larger than most. In the 1998–99 school year, 71 percent of all regular school districts[2] had memberships of fewer than 2,500 students (table C) while all of the 100 largest school districts had memberships of at least 45,000 students (table B). Even though only 14 percent of regular school districts had 5,000 or more students, 68 percent of students (or 2 out of 3) were served by these districts (table C).

The average school district in the United States has 5.6 schools compared to the 100 largest school districts, which average 154.1 schools per district (table A). Two of the largest school districts, New York City Public Schools and the Puerto Rico Department of Education, each have over 1,000 schools (table B). The 100 largest school districts, on average, serve considerably more students (108,579 compared to 2,863) and employ more teachers (5,933 compared to 174) per district than the average school district in the nation (table A).

School characteristics

The 100 largest school districts have more students per school than the average school district, 704.5 compared to 509.8 (table A). In fact, 12 of the 100 largest school districts had an average regular school[3] size of over 1,000 students. In addition to larger school sizes, the 100 largest school districts also have a high mean pupil/teacher ratio, 18.3 to 1 compared to 16.5 to 1 for the average school district (table A). Among the 100 largest districts, half the schools in the Jefferson County school district, Kentucky, were below the median[4] pupil/teacher ratio of 24.0 to 1 and half the schools in the St. Paul school district, Minnesota, were above the median pupil/teacher ratio of 9.8 to 1.

The number of high school graduates as a percentage of all students in the 100 largest school districts was lower than that of the average school district: 4 percent of students

[2]A regular school district is an agency responsible for providing free public education for school-age children residing within its jurisdiction. This category excludes local supervisory unions that provide management services for a group of associated school districts; regional education service agencies that typically provide school districts with research, testing, and data processing services; state and federally operated school districts; and other agencies that do not fall into these groupings.

[3]A regular school is a public elementary/secondary school that does not focus primarily on vocational, special, or alternative education.

[4]If all the pupil/teacher ratios were listed in order, the midpoint on the list would be the median.

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Table B.—Selected statistics for the 100 largest school districts in the United States:[1] School year 1998–99

Name of reporting district	City	State	County	Number of students[2]	Number of full-time-equivalent (FTE) teachers	Number of 1997–98 graduates	Number of schools
Total				**10,857,943**	**593,277**	**479,632**	**15,412**
New York City Public Schools	New York	NY	Kings	1,072,628	62,930	37,851	1,162
Los Angeles Unified	Los Angeles	CA	Los Angeles	695,885	33,022	25,843	650
Puerto Rico Dept of Education	Hato Rey	PR	San Juan	601,902	39,849	29,891	1,538
City of Chicago School District 29	Chicago	IL	Cook	430,914	23,540	16,567	592
Dade County School District	Miami	FL	Dade	352,536	17,616	14,401	329
Broward County School District	Fort Lauderdale	FL	Broward	231,187	11,145	9,637	229
Houston Independent School District	Houston	TX	Harris	210,179	11,682	7,421	296
Philadelphia City School District	Philadelphia	PA	Philadelphia	207,465	10,695	8,991	259
Clark County School District	Las Vegas	NV	Clark	203,777	10,068	8,165	229
Hawaii Department of Education	Honolulu	HI	Honolulu	188,069	10,639	10,369	254
Detroit City School District	Detroit	MI	Wayne	173,557	8,705	6,573	269
Dallas Independent School District	Dallas	TX	Dallas	159,908	8,807	5,659	223
Hillsborough County School District	Tampa	FL	Hillsborough	156,452	9,373	6,393	200
Fairfax County Public Schools	Fairfax	VA	Fairfax	149,029	—	9,087	206
Palm Beach County School District	West Palm Beach	FL	Palm Beach	146,568	7,872	6,112	164
Orange County School District	Orlando	FL	Orange	138,866	8,019	5,840	175
San Diego City Unified	San Diego	CA	San Diego	138,433	6,945	5,928	174
Prince George's County Public Schools	Upper Marlboro	MD	Prince George's	130,259	7,621	7,287	187
Montgomery County Public Schools	Rockville	MD	Montgomery	127,933	7,771	7,413	188
Duval County School District	Jacksonville	FL	Duval	127,411	6,609	4,703	174
Memphis City School District	Memphis	TN	Shelby	111,682	6,875	5,736	161
Pinellas County School District	Largo	FL	Pinellas	110,582	6,153	4,744	159
Baltimore City Public School System	Baltimore	MD	Baltimore	106,540	6,005	4,103	182
Baltimore County Public Schools	Towson	MD	Baltimore	105,914	6,532	5,984	168
Jefferson (KY) County	Louisville	KY	Jefferson	101,438	5,288	5,080	173
Milwaukee School District	Milwaukee	WI	Milwaukee	99,814	5,853	3,247	204
Gwinnett County School District	Lawrenceville	GA	Gwinnett	98,784	5,990	4,775	80
Charlotte-Mecklenburg Schools	Charlotte	NC	Mecklenburg	98,758	6,369	4,298	134
De Kalb County School District	Decatur	GA	De Kalb	93,171	5,779	4,374	114
Wake County Schools	Raleigh	NC	Wake	92,256	5,686	4,388	106
Cobb County School District	Marietta	GA	Cobb	91,208	5,597	4,796	93
Long Beach Unified	Long Beach	CA	Los Angeles	89,214	3,745	3,916	86
Jefferson (CO) County R-1	Golden	CO	Jefferson	88,654	4,283	4,879	157
Albuquerque Public Schools	Albuquerque	NM	Bernalillo	85,847	5,271	4,771	125
Orleans Parish School Board	New Orleans	LA	Orleans	82,176	4,472	3,676	123
Austin Independent School District	Austin	TX	Travis	79,496	4,851	3,042	102
Fresno Unified	Fresno	CA	Fresno	78,942	3,789	3,180	91
Fort Worth Independent School District	Fort Worth	TX	Tarrant	77,956	4,416	2,834	136
Virginia Beach City Public Schools	Virginia Beach	VA	Virginia Beach City	77,442	—	4,151	83
Polk County School District	Bartow	FL	Polk	77,300	4,410	3,430	132
Cleveland City School District	Cleveland	OH	Cuyahoga	76,500	4,621	1,581	124
Anne Arundel County Public Schools	Annapolis	MD	Anne Arundel	74,079	4,141	3,943	118
Granite School District	Salt Lake City	UT	Salt Lake	73,474	3,270	4,801	97
Jordan School District	Sandy	UT	Salt Lake	73,286	3,088	4,742	77
District of Columbia Public Schools	Washington	DC	District of Columbia	71,889	5,187	2,905	164
Mesa Unified School District	Mesa	AZ	Maricopa	71,284	3,428	3,592	80
Denver County	Denver	CO	Denver	68,790	3,388	2,627	122
Brevard County School District	Melbourne	FL	Brevard	68,681	3,754	3,259	99
Nashville-Davidson County SD	Nashville	TN	Davidson	67,016	4,819	4,004	125
Fulton County School District	Atlanta	GA	Fulton	65,642	4,236	2,844	65
Mobile County School District	Mobile	AL	Mobile	65,324	3,997	3,451	105
Columbus City School District	Columbus	OH	Franklin	64,873	3,732	2,207	145
Boston School District	Boston	MA	Suffolk	63,043	4,183	3,246	130
El Paso Independent School District	El Paso	TX	El Paso	62,945	3,985	3,387	83
Tucson Unified District	Tucson	AZ	Pima	62,670	3,447	2,843	120

See footnotes on second page of this table.

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Table B.—Selected statistics for the 100 largest school districts in the United States:[1] School year 1998–99—Continued

Name of reporting district	City	State	County	Number of students[2]	Number of full-time-equivalent (FTE) teachers	Number of 1997–98 graduates	Number of schools
Northside Independent School District	San Antonio	TX	Bexar	61,308	3,984	3,549	83
Guilford County Schools	Greensboro	NC	Guilford	61,154	3,785	2,934	95
San Francisco Unified	San Francisco	CA	San Francisco	61,042	3,122	3,708	116
Atlanta City School District	Atlanta	GA	Fulton	60,541	3,904	2,087	98
Volusia County School District	Deland	FL	Volusia	59,851	3,568	2,769	88
Davis School District	Farmington	UT	Davis	59,285	2,535	4,177	79
San Antonio Independent School District	San Antonio	TX	Bexar	59,080	3,739	2,528	108
Seminole County School District	Sanford	FL	Seminole	58,156	3,047	2,950	63
Cypress-Fairbanks ISD	Houston	TX	Harris	58,044	3,619	2,883	52
Greenville County School District	Greenville	SC	Greenville	57,884	3,696	3,110	92
East Baton Rouge Parish School Board	Baton Rouge	LA	East Baton Rouge	56,527	3,617	2,858	104
Santa Ana Unified	Santa Ana	CA	Orange	56,071	2,440	1,891	50
Arlington Independent School District	Arlington	TX	Tarrant	55,709	3,406	2,607	68
Lee County School District	Fort Myers	FL	Lee	54,779	3,061	2,871	75
Portland School District 1J	Portland	OR	Multnomah	54,546	2,874	2,427	111
Oakland Unified	Oakland	CA	Alameda	54,256	2,723	1,633	89
Jefferson Parish School Board	Harvey	LA	Jefferson	53,615	3,431	2,482	84
Washoe County School District	Reno	NV	Washoe	52,813	2,967	2,391	87
Knox County School District	Knoxville	TN	Knox	51,667	3,642	2,781	85
Sacramento City Unified	Sacramento	CA	Sacramento	51,378	2,295	2,162	76
Cumberland County Schools	Fayetteville	NC	Cumberland	51,297	3,070	2,367	76
Prince William County Public Schools	Manassas	VA	Prince William	51,111	—	2,822	68
Fort Bend Independent School District	Sugar Land	TX	Fort Bend	50,890	3,053	2,722	50
Chesterfield County Public Schools	Chesterfield	VA	Chesterfield	50,621	—	3,110	58
Cincinnati City School District	Cincinnati	OH	Hamilton	50,332	3,181	1,096	80
Anchorage School District	Anchorage	AK	Anchorage	49,587	2,824	2,296	92
Aldine Independent School District	Houston	TX	Harris	49,453	3,324	1,986	56
Minneapolis	Minneapolis	MN	Hennepin	49,242	3,395	1,810	148
San Bernardino City Unified	San Bernardino	CA	San Bernardino	48,907	2,239	1,778	61
Seattle	Seattle	WA	King	48,280	2,439	2,445	118
Shelby County School District	Memphis	TN	Shelby	48,185	2,682	2,385	47
Garland Independent School District	Garland	TX	Dallas	47,967	2,833	1,973	64
San Juan Unified	Carmichael	CA	Sacramento	47,799	2,247	2,875	82
North East Independent School District	San Antonio	TX	Bexar	47,732	3,116	2,631	63
Wichita	Wichita	KS	Sedgwich	47,479	2,848	2,137	93
Ysleta Independent School District	El Paso	TX	El Paso	47,238	3,051	2,860	60
Buffalo City School District	Buffalo	NY	Erie	47,096	3,274	1,797	74
Caddo Parish School Board	Shreveport	LA	Caddo	47,089	2,961	2,417	73
Garden Grove Unified	Garden Grove	CA	Orange	46,916	2,075	2,373	65
Pasco County School District	Land O Lakes	FL	Pasco	46,065	2,623	1,815	50
St. Louis City	St. Louis	MO	St. Louis City	45,981	3,426	1,171	113
Escambia County School District	Pensacola	FL	Escambia	45,667	2,578	2,229	83
St. Paul	St. Paul	MN	Ramsey	45,349	2,244	1,870	139
Alpine School District	American Fork	UT	Utah	45,208	1,912	2,863	54
Omaha Public Schools	Omaha	NE	Douglas	45,118	2,884	2,239	81

— Not available.

[1] Includes outlying areas, Bureau of Indian Affairs, and Department of Defense (overseas) schools.

[2] Count of students receiving educational services from school district may differ somewhat from the counts in tables 3 and 5 of the complete report, which reflect the count of students from the schools aggregated up to the school district.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey" and "Local Education Agency Universe Survey," 1998–99. (Originally published as table 1 on pp. 10–11 of the complete report from which this article is excerpted.)

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Table C.—Number and percentage of districts and students by district membership size for regular public elementary and secondary school districts in the nation:[1] School year 1998–99

District membership size	Districts			Students			Cumulative totals	
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Districts	Students
Total[2]	**13,160**	**100.0**		**45,178,008**	**100.0**			
100,000 or more	25	0.2	0.2	6,179,114	13.7	13.7	25	6,179,114
25,000 to 99,999	213	1.6	1.8	9,147,028	20.2	33.9	238	15,326,142
10,000 to 24,999	568	4.3	6.1	8,485,090	18.8	52.7	806	23,811,232
7,500 to 9,999	317	2.4	8.5	2,727,565	6.0	58.7	1,123	26,538,797
5,000 to 7,499	689	5.2	13.8	4,200,787	9.3	68.0	1,812	30,739,584
2,500 to 4,999	1,971	15.0	28.8	6,944,360	15.4	83.4	3,783	37,683,944
2,000 to 2,499	769	5.8	34.6	1,725,225	3.8	87.2	4,552	39,409,169
1,500 to 1,999	955	7.3	41.9	1,660,874	3.7	90.9	5,507	41,070,043
1,000 to 1,499	1,335	10.1	52.0	1,655,502	3.7	94.6	6,842	42,725,545
800 to 999	715	5.4	57.4	643,207	1.4	96.0	7,557	43,368,752
600 to 799	863	6.6	64.0	600,519	1.3	97.3	8,420	43,969,271
450 to 599	828	6.3	70.3	432,636	1.0	98.3	9,248	44,401,907
300 to 449	1,038	7.9	78.2	386,241	0.9	99.1	10,286	44,788,148
150 to 299	1,318	10.0	88.2	291,153	0.6	99.8	11,604	45,079,301
1 to 149	1,275	9.7	97.9	98,707	0.2	100.0	12,879	45,178,008
Zero[3]	136	1.0	98.9	0	0.0	100.0	13,015	45,178,008
Not reported	145	1.1	100.0	—	—	100.0	13,160	45,178,008

— Not applicable.

[1]Includes outlying areas, Bureau of Indian Affairs, and Department of Defense (overseas) schools.

[2]Not included in this table are local supervisory unions, regional education service agencies, and state and federally operated agencies.

[3]Membership may be zero in two situations: (1) where the school district does not operate schools but pays tuition for its students in a neighboring district, and (2) where the district provides services for students who are accounted for in some other district(s). Agencies that are not locally operated or do not serve students directly are not included in this table.

NOTE: Detail may not add to cumulative totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Local Education Agency Universe Survey," 1998–99. (Originally published as table B on p. 3 of the complete report from which this article is excerpted.)

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were graduates in the 100 largest school districts compared to 5 percent for the average school district (table A).

Seventy-four of the 100 largest school districts reported data for Title I eligible schools and programs. The percentage of Title I eligible schools in the 74 districts varied widely, from 1 percent to 96 percent. Furthermore, of the 74 districts reporting, a large number reported that these schools were also Title I schoolwide eligible.

Student body composition

The 100 largest school districts are not homogeneous, and certain student characteristics, such as race/ethnicity, poverty level, and disability status, vary across the districts.

The 100 largest districts, with 23 percent of the nation's public school students, served 40 percent of the 18.4 million minority public school students.[5] The proportion of minority students in the 100 largest school districts is almost double the proportion of minority students in all public schools. In the 1998–99 school year, 67 percent of the students in the 100 largest school districts were minority students compared to 39 percent of students nationally (table D). In fact, 8 out of the 10 largest school districts had over 75 percent minority student membership.

Even with the relatively high minority membership in the 100 largest school districts, 44 of the 100 largest school districts report 50 percent or more of their students as white, non-Hispanic. Of these 44 districts, 11 reported minority representation of less than 25 percent of their student body. In 18 of the 100 largest districts, half or more of the membership is black, non-Hispanic. Ten districts report the majority of students are Hispanic; 3 of these are among the 5 largest districts. In Hawaii, which is one district, the majority of the students are Asian/Pacific Islanders. It is also interesting to note that the San Francisco Unified school district has 49.9 percent Asian/Pacific Islander students.

The 100 largest school districts also have a disproportionate percentage of students eligible for the free lunch program relative to all public school districts. Among schools that reported free lunch eligibility, 52 percent of students in the 100 largest school districts were eligible compared to 38 percent of students in all districts (table D). Among the 90 of the 100 largest school districts that reported data on free lunch, 42 districts reported over 50 percent of their students eligible for the free lunch program.

[5]The numbers of students in different racial/ethnic categories are reported at the school level and are aggregated up to the school district level. The national figure was calculated by taking the percent of minority students among those districts that reported race/ethnicity (99.2 percent of districts) and applying this to the total number of public school students.

Table D.—Percentage of students eligible for free and reduced-price lunch and percentage of minority enrollment in the 100 and 500 largest school districts: School year 1998–99

	100 largest school districts	500 largest school districts	All reporting school districts
Percentage of schools reporting free and reduced-price lunch	87.9	88.2	84.1
Percentage of membership eligible for free and reduced-price lunch of those who reported free and reduced-price lunch	*52.3	*46.4	*38.0
Percentage of schools reporting minority membership	100.0	99.7	99.2
Percentage of minority enrollment	66.9	56.9	38.8
American Indian/Alaska Native	0.5	0.7	1.2
Asian/Pacific Islander	6.6	6.0	4.1
Hispanic	29.2	24.7	16.3
Black, non-Hispanic	30.6	25.5	17.2
White, non-Hispanic	33.0	43.2	61.2

*These percentages should be interpreted with caution; six states (Arizona, the District of Columbia, Illinois, Pennsylvania, Tennessee, and Washington) did not report free and reduced-price lunch eligibility and are not included in the national total. Also, states may not have reported students eligible for reduced-price meals, and a number of states reported participation instead of eligibility data, which may not be strictly comparable. Percentages are based on those schools that reported.

NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey" and "Local Education Agency Universe Survey," 1998–99. (Originally published as table C on p. 5 of the complete report from which this article is excerpted.)

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Twelve percent of students in the 100 largest school districts had individualized education programs (IEPs) for students with disabilities. In the largest school district, New York City Public Schools, 14 percent, or 147,674 students, were reported to have IEPs. Only 3 percent of schools in the 100 largest school districts were special education schools.

Revenues and expenditures for fiscal year 1997[6]

In school year 1996–97 (fiscal year 1997), $307 billion were collected for public elementary and secondary education in the 50 states, the District of Columbia, and outlying areas: 22 percent ($69 billion) of this revenue went to the 100 largest school districts. Of the $69 billion revenue to the 100 largest school districts, a little less than one-third ($20 billion) was received by the 5 largest school districts (New York City Public Schools, Los Angeles Unified, Puerto Rico Department of Education, City of Chicago School District, and Dade County School District). The dollars from the federal government received by 99 of the 100 largest school districts comprised from 2 to 16 percent of all revenues to the district; the exception was Puerto Rico (28 percent).

The 100 largest school districts spent $60 billion (22 percent) of the $273 billion in current expenditures spent on the 50 states, the District of Columbia, and outlying areas in 1996–97. The two largest school districts, New York City Public Schools and Los Angeles Unified, spent one out of every five dollars expended by the 100 largest school districts. All of the 100 largest school districts devoted more than 50 percent of their current expenditures to instruction. Of the 100 largest school districts, New York City Public Schools spent the greatest proportion, 71 percent, on instruction.

The current expenditures per pupil were $5,923 for all districts in the 50 states and the District of Columbia, slightly higher than the $5,653 in the 100 largest school districts. Of the 100 largest school districts, 15 districts spent more than $7,000 per pupil (with Newark City School District, New Jersey, spending the most, at $11,578 per pupil), and one school district, Puerto Rico Department of Education, spent less than $3,000 per pupil.

Changes in the 100 largest school districts between 1988 and 1998

While there was a lot of movement within the 100 largest school districts over time, between the 1988–89 and 1998–99 school years, the 100 largest districts remained very similar. Only 10 of the 100 largest districts in the 1998–99 school year were not in the 100 largest in the 1988–89 school year. Clark County School District in Nevada was the only district to move into the largest 10 districts between these years (it moved from a rank of 19 in 1988–89 to 9 in 1998–99) (table B). Clark County includes the Las Vegas metropolitan area, which was the

[6]National revenue and expenditure data were calculated from the state-level "National Public Education Financial Survey" (NPEFS) and can be found in *Revenues and Expenditures for Public Elementary and Secondary Education: School Year 1996–1997* (Johnson 1999). The percentage distribution was based on school district–level data found on the Census Bureau's "Annual Survey of Government Finances: School Systems" (F-33 survey). Department of Defense (overseas) and Bureau of Indian Affairs schools are not included in these national totals.

Table E.—Number of students, teachers, and schools in the 100 largest school districts in the United States in school years 1988–89 and 1998–99

	1988–89			1998–99		
	100 largest districts	All districts*	Percentage of national total	100 largest districts	All districts*	Percentage of national total
Students	9,389,053	40,427,258	23.2	10,857,943	47,354,912	22.9
Full-time-equivalent (FTE) teachers	443,812	1,940,931	22.9	593,277	2,875,045	20.6
Schools	14,123	83,346	16.9	15,412	92,883	16.6

*For 1988–89, includes the outlying areas. For 1998–99, includes outlying areas, Bureau of Indian Affairs, and Department of Defense (overseas) schools. The addition of the Bureau of Indian Affairs and Department of Defense schools accounts for 0.3 percent more students, 0.2 percent more teachers, and 0.4 percent more schools.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Local Education Agency Universe Survey" and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1988–89 and 1998–99. (Originally published as table D on p. 6 of the complete report from which this article is excerpted.)

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fastest growing metropolitan area in the country in the early nineties (Bureau of the Census 1997).

The number of students in the 100 largest school districts increased by 16 percent between 1988–89 and 1998–99, the number of teachers increased by 34 percent, and the number of schools increased by 9 percent. However, while the numbers of students, teachers, and schools in the 100 largest school districts have increased between these 2 years, the proportion of the national total these numbers comprised was essentially unchanged. For example, the number of students in the 100 largest school districts went from 23.2 percent of all districts in 1988–89 to 22.9 percent in 1998–99 (table E).

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Data sources:

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Young, B.A. (2000). *Characteristics of the 100 Largest Public Elementary and Secondary School Districts in the United States: 1998–1999* (NCES 2000–345).

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To obtain the complete report (NCES 2000–345), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov)*, or contact GPO (202–512–1800).

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Postsecondary Students With Disabilities: Enrollment, Services, and Persistence

David Hurst and Becky Smerdon (editors)

This article was originally published as a Stats in Brief. The sample survey data are from several NCES surveys, which are listed at the end of this article.

How do the postsecondary enrollment and attainment patterns of students with disabilities compare to students without disabilities? What types of accommodations do institutions provide students with disabilities? These are among the important questions raised by legislation such as the Americans with Disabilities Act (ADA) and the Individuals with Disabilities Education Act (IDEA). To address these questions, it is useful to examine information provided by both students (Horn and Berktold 1999) and institutions (Lewis and Farris 1999) on students with disabilities in postsecondary institutions and the types of services institutions provide.[1] Because a number of different surveys are mentioned in this Stats in Brief, it is important to note the particular population that was sampled and the year in which the survey was administered.

Enrollment of Students With Disabilities

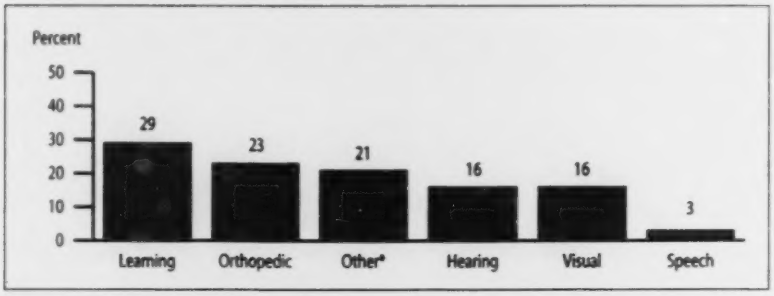
According to the 1995–96 National Postsecondary Student Aid Study (NPSAS:1996), roughly 6 percent of all undergraduates reported having a disability (not shown in tables). Among 1995–96 undergraduates with a disability, approximately 29 percent reported having a learning disability, and 23 percent reported an orthopedic impairment (figure 1). About 16 percent of students with disabilities reported having a hearing impairment, 16 percent a vision impairment, and 3 percent a speech impairment. In addition, one in five undergraduates with disabilities (21 percent) reported having another "health-related" disability or limitation.[2]

Students with and without disabilities differed somewhat with respect to age and the type of institution they attended in 1995–96. The average age of students with disabilities was 30, compared to an average age of 26 among students without disabilities, and nearly one-quarter of students with disabilities were 40 or over, compared to 12 percent of students without disabilities (not shown in tables). Those with disabilities were less likely to be enrolled in public 4-year colleges and universities (25 vs. 32 percent) and more likely to attend either public 2-year institutions or

[1] These data should not, however, be interpreted as implying any relationship between the enrollment of students with disabilities in postsecondary institutions and the accommodations that institutions provide.

[2] These percentages do not sum to 100 because some students reported multiple disabilities.

Figure 1.—Among 1995–96 undergraduates who reported a disability, the percentage reporting each disability type



*Any other health-related disability or impairment.

NOTE: Percentages do not sum to 100 because some students reported multiple disabilities.

SOURCE: U.S. Department of Education, National Center for Education Statistics, (1999) *Students With Disabilities in Postsecondary Education: A Profile of Preparation, Participation, and Outcomes* (NCES 1999–187).

"other" institutions, which include for-profit vocational institutions (not shown in tables). Students with disabilities, however, were about as likely as students without disabilities to attend private not-for-profit 4-year institutions (14 and 15 percent, respectively).

Support Services and Accommodations

In a Postsecondary Education Quick Information System (PEQIS) survey conducted in the spring of 1998, a representative sample of 2-year and 4-year postsecondary institutions was asked about the enrollment of students with disabilities in 1996–97 or 1997–98.[3] About three-quarters (72 percent) of the nation's 5,040 2-year and 4-year postsecondary education institutions enrolled students with disabilities in 1996–97 or 1997–98 (table 1). Almost all (98 percent) public 2-year and public 4-year institutions enrolled students with disabilities, compared with 63 percent of private 4-year and 47 percent of private 2-year institutions.

Institutions that enrolled students with disabilities in 1996–97 or 1997–98 were asked whether the institution had provided various special support services or accommodations designed for disabled students to any students with disabilities during 1996–97 or 1997–98. Almost all (98 percent) of the institutions that enrolled students with disabilities had provided at least one support service or accommodation (not shown in tables). Most institutions (88 percent) had provided alternative exam formats or additional time, and 77 percent provided tutors to assist with ongoing coursework (table 1). Readers, classroom notetakers, or scribes were provided by 69 percent of the institutions, and registration assistance or priority class registration was provided by 62 percent. Institutions also frequently provided textbooks on tape (55 percent) and adaptive equipment and technology (58 percent), such as assistive listening devices or talking computers. Sign language interpreters/transliterators were provided by 45 percent of the institutions, and course substitutions or waivers by 42 percent.

Whether various support services or accommodations were provided varied substantially by institution type and size (table 1). The general pattern was that public 2-year and 4-year institutions were more likely than private 2-year and 4-year institutions to have provided a service or accommodation, and medium and large institutions were more likely than small institutions to have provided a service or accommodation. Large institutions were also more likely than medium institutions to have provided many of the services.

Postsecondary Persistence and Attainment

Information on the postsecondary persistence and attainment of students with and without disabilities is available from the 1990 Beginning Postsecondary Students Longitudinal Study (BPS:1990/1994), which is a representative sample of students who enrolled in postsecondary education for the first time in the 1989–90 school year.[4] These students were subsequently surveyed in 1992 and 1994.

[3] Institutions' knowledge about student disabilities is based on student self-report. Some students may report a disability but require no accommodations.

[4] The enrollment patterns of the 1989–90 first-time beginning postsecondary students examined in this section are somewhat different from the patterns of all undergraduate students enrolled in 1995–96, which were described above. Among first-time beginning students in 1989–90, those with disabilities were about as likely as their counterparts without disabilities to attend public 2-year colleges and to attend public 4-year colleges and universities. They were less likely than students without disabilities to attend private not-for-profit 4-year colleges and universities, and more likely to attend other types of postsecondary institutions. See Horn and Berktold (1999) for more information.

Table 1.—Percentage of 2-year and 4-year postsecondary education institutions that enrolled students with disabilities in 1996–97 or 1997–98, by type of accommodations offered to students with disabilities and institutional characteristics

Institutional characteristics	Institutions enrolling students with disabilities	Among institutions enrolling students with disabilities, percentage providing various services or accomodations[1]							
		Alternative exam formats or additional time	Tutors to assist with ongoing coursework	Readers, classroom notetakers, or scribes	Registration assistance or priority class registration	Adaptive equipment and technology	Textbooks on tape	Sign language interpreters/ transliterators	Course substitution or waiver
All institutions	**72**	**88**	**77**	**69**	**62**	**58**	**55**	**45**	**42**
Institution type									
Public 2-year	98	94	87	82	77	81	66	66	48
Private 2-year	47	55	51	18	26	30	11	10	15
Public 4-year	98	100	82	93	83	80	85	68	69
Private 4-year	63	90	75	66	53	39	49	29	35
Size of institution									
Less than 3,000	63	82	71	55	48	43	40	28	29
3,000 to 9,999	99	99	90	93	88	86	82	71	61
10,000 or more	100	100	84	[2]100	95	97	93	96	81

[1]In addition to those listed in this table, institutions were also asked about a number of other services and accommodations. This table includes some of the more frequent accommodations institutions reported providing. For a complete list, see *An Institutional Perspective on Students With Disabilities in Postsecondary Education* (NCES 1999–046).

[2]Statistic is estimated at 99.6 percent, which is rounded to 100 percent for presentation in this table.

NOTE: Information about students with disabilities represents only those students who identified themselves to their institution as having a disability, since these are the only students about whom the institutions could report. Less-than-2-year institutions were not included in this survey.

SOURCE: U.S. Department of Education, National Center for Education Statistics, (1999) *An Institutional Perspective on Students With Disabilities in Postsecondary Education* (NCES 1999–046).

Among 1989–90 beginning postsecondary students, students with disabilities were less likely than those without disabilities to have attained bachelor's or associate's degrees by 1994 (table 2). While it appears as though students with disabilities were more likely than students without disabilities to have completed vocational certificates (19 and 12 percent), the difference was not statistically significant. When looking within institutional sector, many differences remained. For example, among those enrolled in public 4-year institutions, 33 percent of students with disabilities had completed bachelor's degrees, compared with 48 percent of students without disabilities. Among students enrolled in public 2-year institutions, similar proportions of students with and without disabilities earned some kind of postsecondary credential, though students without disabilities were more likely to earn associate's degrees (18 vs. 7 percent). About 6 percent of both groups who started in public 2-year colleges attained bachelor's degrees.

Because the BPS survey covers a period of 5 academic years, not all students had completed their degrees by 1994. Therefore, it is also useful to examine the rate of overall persistence, which includes students who either attained a degree or who were still enrolled in 1994. Viewed from this perspective, about 53 percent of students with disabilities had persisted in their postsecondary program. In contrast, 64 percent of students without disabilities had done so (not shown in tables).

Comparability of Data

This Stats in Brief reports the results of several National Center for Education Statistics (NCES) surveys that have collected information on students with disabilities. Estimates of the number of students with disabilities and the types of disabilities reported may differ depending on how the survey question is worded, when it is asked, and to whom the question is addressed (e.g., student, parent, or institution).[5] Estimates may also depend on the timing of the survey relative to implementation of legislation such as IDEA.

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[5]Horn and Berktold (1999) describe when and how the questions related to disabilities were asked in each of several student surveys.

Table 2.—Percentage distribution of 1989–90 beginning postsecondary students according to highest undergraduate degree attained by 1994, by disability status and first institution attended

	None	Vocational certificate	Associate's	Bachelor's
Total	**50**	**13**	**11**	**26**
Does not have a disability	49	12	12	27
Has a disability	59	19	6	16
Public 4-year				
Does not have a disability	44	3	5	48
Has a disability	55	8	3	33
Private not-for-profit 4-year				
Does not have a disability	28	2	3	67
Has a disability	35	6	2	57
Public 2-year				
Does not have a disability	63	12	18	6
Has a disability	66	21	7	6
Other institutions*				
Does not have a disability	40	45	13	2
Has a disability	59	33	6	2

*Students enrolled in private for-profit institutions; public less-than-2-year institutions; or private not-for-profit less-than-4-year institutions.

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, (1999) *Students With Disabilities in Postsecondary Education: A Profile of Preparation, Participation, and Outcomes* (NCES 1999–187).

Data sources: The NCES 1995–96 National Postsecondary Student Aid Study (NPSAS:1996); Postsecondary Education Quick Information System (PEQIS), "Survey on Students With Disabilities at Postsecondary Education Institutions," 1998; and 1990 Beginning Postsecondary Students Longitudinal Study (BPS:1990/1994).

For technical information, see

Horn, L., and Berktold, J. (1999). *Students With Disabilities in Postsecondary Education: A Profile of Preparation, Participation, and Outcomes* (NCES 1999–187).

Lewis, L., and Farris, E. (1999). *An Institutional Perspective on Students With Disabilities in Postsecondary Education* (NCES 1999–046).

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Entry and Persistence of Women and Minorities in College Science and Engineering Education

Gary Huang, Nebiyu Taddese, and Elizabeth Walter

This article was originally published as the Executive Summary of the Research and Development Report of the same name. The sample survey data are from the National Education Longitudinal Study of 1988 Eighth-Graders (NELS) and the 1990 Beginning Postsecondary Students Longitudinal Study (BPS).

Research and Development Reports are intended to

- Share studies and research that are developmental in nature.
- Share results of studies that are on the cutting edge of methodological developments.
- Participate in discussions of emerging issues of interest to researchers.

These reports present results or discussion that do not reach definitive conclusions at this point in time, either because the data are tentative, the methodology is new and developing, or the topic is one on which there are divergent views. Therefore, the techniques and inferences made from the data are tentative and are subject to revision.

Introduction

This study examines the gaps related to gender and race/ethnicity in entry, persistence, and attainment of postsecondary science and engineering (S&E) education. After reviewing selected prior research and examining potentially relevant variables in two National Center for Education Statistics (NCES) surveys, several variables were selected to create a multivariate model for use in two empirical analyses. The overall goal of the study was to try to determine the relative importance of these variables in sustaining the gender and race/ethnicity gaps in S&E education. The specific goals for the two analyses are described below.

The first analysis examines the link between high school experience and entry into S&E postsecondary programs to explore the extent to which women and underrepresented minorities continue to have lower entry rates into S&E programs at the postsecondary level. This part of the study analyzes data from the National Education Longitudinal Study of 1988 Eighth-Graders (NELS:1988/1994). Now that the 1994 third follow-up survey data are available, researchers can follow a nationally representative population of 1988 8th-graders through high school and into college or the workforce.

The second analysis addresses issues relating to persistence and degree attainment by underrepresented minorities and women in postsecondary S&E study. It traces a cohort of postsecondary students who began their S&E education in their *first* postsecondary year (i.e., as freshmen) through a 5-year time frame (1989–90 to 1993–94) using data from the 1990 Beginning Postsecondary Students Longitudinal Study (BPS:1990/1994).

The two analyses are presented in one report to address an overarching policy concern, namely, gender and racial/ethnic gaps in postsecondary S&E entry and persistence. It was thought that presenting both analyses in one report may help readers learn about the policy issues in a more coherent way because entry and persistence are related equity concerns. However, the reader is cautioned against linking the results of the two analyses because the data sources are independent cohorts.

Findings

Entering the S&E pipeline

The findings from the first analysis support an overall notion that much of the racial/ethnic and gender difference in the entry into S&E programs in postsecondary education can be explained by examining family environment, family support, student behavior, and school factors across race/ethnicity and gender. That is, while the initial findings showed that the racial/ethnic gap only occurred among men and the gender gap mainly happened among Asians and whites, further examination showed that students of any race/ethnicity or gender with the following characteristics had a greater likelihood of entering into (i.e., majoring in) S&E in postsecondary education:

- students who had taken advanced science courses;
- students who were self-motivated to study science;
- students who had parents with relatively higher levels of educational attainment; and
- students who had parents with high expectations for their children's college education.

Once these key factors were held constant—that is, comparing racial/ethnic and gender groups with similar attributes in these measures—the racial/ethnic and gender differences among S&E majors tended to get smaller.

Additional findings related to S&E entry include the following:

- A separate analysis of the male students confirmed that the racial/ethnic gap in majoring in S&E among men steadily closes when comparing students who had similar motivation, aspirations, and confidence regarding math and science; who had earned similar total and advanced credits in the subjects; and whose parents' educational attainment and expectation for their child's education were similar.
- Since the broad gender gap only narrowed to a limited extent after examining family environment and support, student behavior, and school factors, it was hypothesized that traditional values that emphasize marriage, family, and children, in contrast to "nontraditional" views that stress individual success and independence, might make a difference in female students' career choice. However, the results did not support this hypothesis.
- A separate analysis of white and Asian students revealed no different pattern of gender gap from that found in the overall analysis.

Persistence and attainment in the S&E pipeline

The second analysis yields important findings regarding underrepresented minority and female students' status in and out of the S&E pipeline.

- While the racial/ethnic gap is not as obvious as the gender gap in enrolling as S&E majors, underrepresented minority students face greater difficulties in S&E programs.
- Among the students enrolled in S&E programs in the first year of postsecondary education, underrepresented minority students seemed to have difficulty attaining a degree in S&E fields within a 5-year college calendar. Some of them had to switch to other fields. However, data did not show racial/ethnic differences in college dropout rates among these S&E students.
- The racial gap remained wide even after the multiple regression analysis considered theoretically important predictors of success, a finding that implies that more extensive factors should be examined in order to understand the racial/ethnic difference in S&E attainment and persistence, including a detailed analysis of course-taking patterns.
- Female students in S&E programs did not fall behind in the pipeline; they actually were more likely than male students to complete an S&E degree and less likely to switch to a non-S&E program. This finding suggests that although women are less likely than men to enter S&E, those women who do enter S&E fields are likely to do well. Further, among students enrolled in 4-year S&E programs in the first year of college, women tend to have strong family support, high expectations, healthy self-confidence, and solid academic preparation.

Data sources: The National Education Longitudinal Study of 1988 Eighth-Graders (NELS:1988/1994) and the 1990 Beginning Postsecondary Students Longitudinal Study (BPS:1990/1994).

For technical information, see the complete report:

Huang, G., Taddese, N., and Walter, E. (2000). *Entry and Persistence of Women and Minorities in College Science and Engineering Education* (NCES 2000–601).

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To obtain the complete report (NCES 2000–601), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov)*, or contact GPO (202–512–1800).

Debt Burden Four Years After College

Susan P. Choy

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The sample survey data are from the Baccalaureate and Beyond Longitudinal Study (B&B).

Federal student loan programs are a major source of financial aid for students in postsecondary education. Loans provide students lacking the financial resources to attend college with a way to invest in their futures. However, excessive borrowing can cause problems later. Therefore, it is important to identify and describe the postgraduation consequences of borrowing and to understand what levels of borrowing may cause trouble later on.

This report examines the debt of 1992–93 bachelor's degree recipients in light of their financial circumstances in 1997, approximately 4 years after they earned their degree. First, it reviews the amount they borrowed as undergraduates and describes any additional borrowing by those who had enrolled in a graduate degree program. Amounts borrowed through student loan programs, from parents, and from other private sources are all included. Next, it examines the progress that borrowers had made in repaying their student loans by 1997. Finally, the report describes their debt burden by examining the relationship between student loan payments and income and by searching for other indications of the impact of borrowing. It does this by comparing borrowers at various levels with nonborrowers in terms of their expenditures for certain major items such as rent or a mortgage, a car, and credit card purchases, and by examining how borrowing affects specific lifestyle choices such as family formation, buying a home or car, and saving. The analysis uses data collected through the 1993 Baccalaureate and Beyond Longitudinal Study (B&B:1993) and the two follow-ups conducted in 1994 and 1997 (B&B:1993/1994 and B&B:1993/1997).

The analysis distinguishes among three groups of undergraduate borrowers: (1) those with no further postsecondary enrollment by 1997 (53 percent of all undergraduate borrowers); (2) those who enrolled for further postsecondary education after receiving their bachelor's degree but nevertheless were in repayment in 1997 (24 percent of all undergraduate borrowers); and (3) those who enrolled for further education but were not in repayment in 1997 (23 percent of all undergraduate borrowers).

Borrowing for Education

About one-half of all 1992–93 bachelor's degree recipients borrowed to help pay for their undergraduate education. Those who took out loans borrowed an average of $10,100. By 1997, 29 percent of all bachelor's degree recipients had enrolled in a graduate degree or first-professional degree program. About one-half of them (14 percent) had borrowed to help pay for their graduate education, and the other half had not.

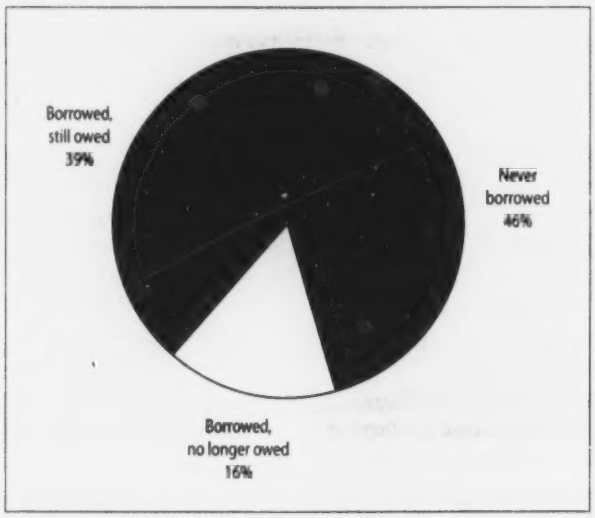
The amount borrowed for education varied with graduates' postbaccalaureate experience. For those with no further enrollment after the bachelor's degree, 51 percent had borrowed for undergraduate education; the average amount borrowed was $10,500. Among undergraduate borrowers who had completed a master's degree by 1997, 69 percent had borrowed to help pay for their education at one or both levels, and the average total amount borrowed (including both levels) was $20,800. Among undergraduate borrowers who had completed a first-professional degree by 1997, 9 out of 10 had borrowed, with an average of $63,400 borrowed in total.

Undergraduate borrowing appears to have a minor discouraging effect on further enrollment in the short term. Undergraduates who borrowed $5,000 or more were slightly less likely than nonborrowers to have enrolled for further education by 1994 (16 percent vs. 20 percent). This effect persisted even after controlling for sex, race/ethnicity, age when they received their degree, type of institution from which they graduated, undergraduate major, and grade-point average (Choy and Geis 1997). However, the early negative impact of borrowing had disappeared by 1997, when (controlling for the same factors) there was no statistically significant relationship between undergraduate borrowing and enrolling in either a graduate degree program or any other postsecondary program.

Debt Status in 1997

The debt status of 1992–93 bachelor's degree recipients in 1997 can be summarized as follows: 46 percent did not owe any money because they had never borrowed at either the

Figure A.—Percentage distribution of 1992–93 bachelor's degree recipients according to debt status in 1997



NOTE: Based on borrowing at both undergraduate and graduate levels. Detail may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:1993/1997), Data Analysis System.

undergraduate or graduate levels; another 16 percent had borrowed at one or both levels, but no longer owed on those loans; and the remaining 39 percent still owed on education loans (figure A).

Figure B shows the percentages who borrowed, still owed, and were in repayment in 1997, by education status as of 1997. Too few doctoral students had completed their degrees by 1997 for reliable estimates of their debt status. The difference between the percentages who borrowed and who still owed represents the proportion who had repaid their loans (or had them forgiven) by 1997. The difference between the percentages who still owed and who were in repayment represents the proportion who were in deferment, who were in default, or who were not required to repay loans at that time. Figure B also shows the average amounts borrowed and owed, and the average amounts being paid on a monthly basis.

The 1992–93 bachelor's degree recipients who had borrowed as undergraduates but had not enrolled for any further education had made some progress in eliminating their debt by 1997. Among 1992–93 bachelor's degree recipients who had not enrolled for any additional postsecondary education by 1997, 51 percent had borrowed for their undergraduate education, and 33 percent still owed on those loans in 1997. Thus, 18 percent had paid off their education debts (or had them forgiven). Almost all of those who owed were in repayment (the difference between the 33 percent who owed and the 29 percent who were in repayment is not statistically significant).

Among 1992–93 bachelor's degree recipients who had earned a master's degree by 1997, 69 percent had borrowed at one or both levels. By 1997, about 14 percent had been able to discharge their debt despite earning a second degree, and 55 percent still had outstanding loans. Thirty-nine percent were making payments, which means that about 16 percent were not being required to make payments, most likely because they had just recently completed their degree and were still in deferment. The average amount still owed by master's degree holders was substantially greater than the amount still owed by those who had not enrolled for further education ($17,200 vs. $7,100).

Among 1992–93 bachelor's degree recipients who had earned a first-professional degree by 1997, 91 percent had borrowed to help pay for their education, and most (80 percent) still owed on their loans. Because first-professional programs usually take at least 3 or 4 years to complete,

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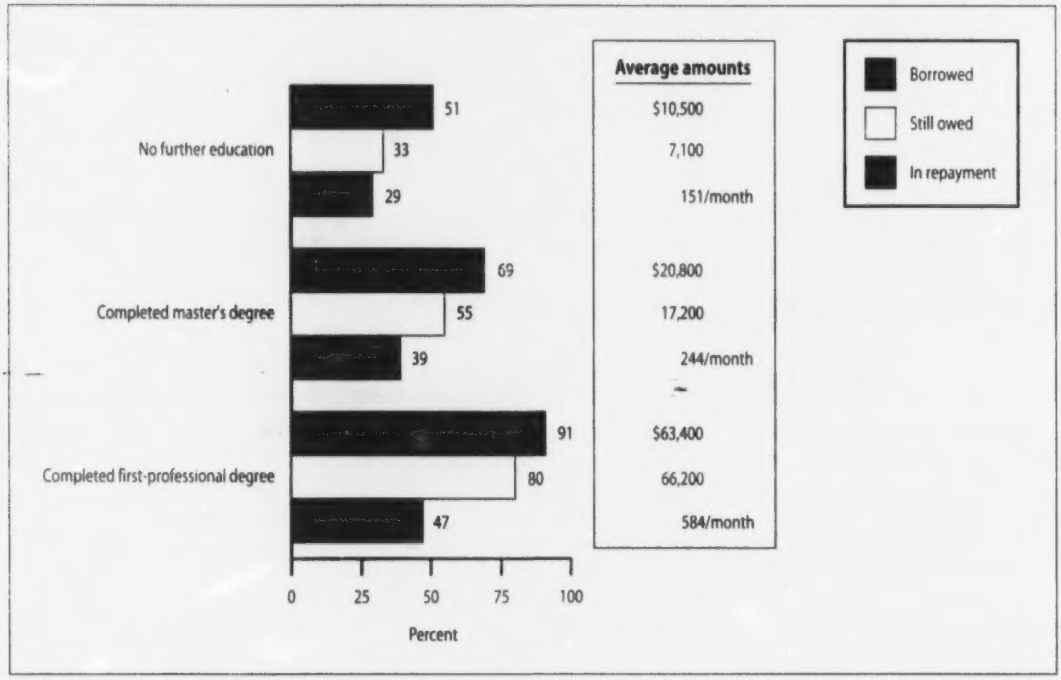
Figure B.—Percentages of 1992–93 bachelor's degree recipients who had borrowed for education, still owed, and were in repayment, by level of education after bachelor's degree: 1997



NOTE: Based on borrowing at both undergraduate and graduate levels.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:1993/1997), Data Analysis System.

most would have graduated very recently. Thus, a comparatively low proportion (47 percent) were in repayment in 1997. The average amount owed by this group ($66,200) was substantially higher than the average amount owed by those who had completed a master's degree ($17,200). This difference reflects higher tuition, more frequent full-time enrollment, limited time to work while enrolled, and little time after undergraduate enrollment to accumulate savings.

Although it appears that the average amount owed is greater than the average amount borrowed for those who had completed a first-professional degree ($66,200 vs. $63,400), the difference is not statistically significant. It is likely that the few who no longer owed had taken out relatively small loans, leaving those with high loan amounts still owing. This would have the effect of raising the average amount owed after the smaller loans were removed. Furthermore, some borrowers may have had the accrued interest on their loans added to the principal while they were enrolled and thus increased the amount owed.

Debt Burden

Monthly loan payments as a percentage of income

The undergraduate borrowers with no further enrollment by 1997 were well positioned to repay their loans. Almost all (88 percent) were employed full time, and their average income in 1997 was $35,300. The median monthly debt burden (the percent of monthly income used to repay loans) for those in repayment was 5 percent. Approximately 8 out of 10 had debt burdens of less than 10 percent. To place this debt burden in context, housing lenders typically use an 8 percent rule for student loan debt.

The median debt burden of those who had further enrollment but were repaying their loans (6 percent) was similar to the median debt burden of those with no further enrollment.

About half of undergraduate borrowers were married in 1997. The median household debt burden was 3 percent for those without further enrollment. Even among those where

the total amount borrowed by both spouses was $15,000 or more, the median debt burden was 5 percent. Thus, the added income of a spouse appears to lessen the burden of student loans.

Other indicators of debt burden

Among 1992–93 bachelor's degree recipients, there is no evidence that borrowing for education affects lifestyle choices such as the timing of marriage or major purchases such as a car or house. One-half of nonborrowers were married in 1997, as was also true for borrowers. The percentages who were married in 1997 did not differ among any of the three groups of borrowers (those with no further enrollment, those with further enrollment but in repayment, and those with further enrollment and not in repayment) or between any of these groups of borrowers and nonborrowers. Also, no differences were observed in the percentages owning a car or another vehicle in 1997: about 9 out of 10 did so regardless of borrowing or enrollment status.

There was one difference regarding the purchase of a house or condominium. Those who borrowed for undergraduate education, enrolled for further education, and were not in repayment were less likely to own a house or condominium in 1997 (34 percent) than were nonborrowers or borrowers with no further enrollment (43 percent each). This finding might reflect the fact that many of those with further enrollment who were not in repayment were still enrolled in 1997.

The percentages of 1992–93 bachelor's degree recipients who were saving money might also provide clues as to whether education debt causes economic hardship for undergraduate borrowers. If repaying education loans were causing serious financial stress, one might expect to see those with high debt burdens less likely to save. However, this was not the case. Among those who borrowed for their undergraduate education but did not enroll for further education, 70 percent were saving for some purpose in 1997, the same percentage as nonborrowers. A similar proportion of those who enrolled for further education and were repaying their loans in 1997 were saving (66 percent). Among those who enrolled for further education and were not repaying their loans in 1997, 60 percent were saving. This was a smaller percentage than that for borrowers who had not continued their education or for nonborrowers (70 percent each); however, some were still enrolled and therefore might not be expected to be saving.

Conclusion

About one-half of all 1992–93 bachelor's degree recipients borrowed to help pay for their undergraduate education, and about one-half of the 29 percent who went on to graduate school borrowed, either as new or continuing borrowers. By 1997, approximately 4 years after they graduated, 62 percent of the 1992–93 bachelor's degree recipients were debt free (46 percent had never borrowed at either level and 16 percent had borrowed but no longer owed).

Among those with no further enrollment after their bachelor's degree, those who still had debt in 1997 (33 percent) owed an average of $7,100 and were making education loan payments averaging $151 per month. Most were well positioned financially to make these payments: 88 percent were employed full time in April 1997 and if employed full time were earning an average of $35,300. The median debt burden (monthly payments as a percentage of monthly income) was 5 percent. Being married tended to reduce debt burden. Overall, borrowing does not appear to affect major lifestyle choices or purchases or the propensity to save.

For 1992–93 bachelor's degree recipients, undergraduate borrowing did appear to have a slight negative effect on graduate enrollment by 1994. However, the effect had disappeared by 1997.

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Data source: The NCES 1993 Baccalaureate and Beyond Longitudinal Study (B&B:1993/1997).

For technical information, see the complete report:

Choy, S.P. (2000). *Debt Burden Four Years After College* (NCES 2000–188).

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To obtain the complete report (NCES 2000–188), visit the NCES Web Site *(http://nces.ed.gov)* or contact Aurora D'Amico *(aurora_d'amico @ed.gov).*

College Quality and the Earnings of Recent College Graduates

Robert A. Fitzgerald

This article was originally published as the Executive Summary of the Research and Development Report of the same name. The sample survey data are from the NCES High School and Beyond (HS&B) Longitudinal Study and the universe data are from the Integrated Postsecondary Education Data System (IPEDS).

Research and Development Reports are intended to

- Share studies and research that are developmental in nature.
- Share results of studies that are on the cutting edge of methodological developments.
- Participate in discussions of emerging issues of interest to researchers.

These reports present results or discussion that do not reach definitive conclusions at this point in time, either because the data are tentative, the methodology is new and developing, or the topic is one on which there are divergent views. Therefore, the techniques and inferences made from the data are tentative and are subject to revision.

Introduction

This report examines the association between factors such as selectivity and other institutional characteristics, and the earnings of recent college graduates 5 years after graduation. The report addresses a number of questions of interest to students who are deciding which college to attend, as well as to their parents and institutional and government policymakers. These questions include the following:

- Are the earnings of recent graduates associated with the characteristics of the colleges and universities from which they graduated?
- Is where a student went to college more or less important for earnings than the choices he or she made while enrolled about how much effort to expend on studies or which field to major in?
- If some institutional characteristics are associated with higher earnings, which ones are they? Are larger colleges better than smaller ones? Are more selective colleges associated with higher earnings? How much does it matter whether the institution's mission is research or teaching?
- Are institutional effects on earnings the same for women as they are for men, or do these effects vary systematically by sex?

To address these issues, data from the High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:1980/1992) were combined with information about courses, grades, credits, and credentials contained in the "Postsecondary Education Transcript Study" (HS&B-So:PETS), a comprehensive source of information about the postsecondary experiences of the HS&B sophomore cohort. Information about the colleges that 1980 sophomores attended came from the Integrated Postsecondary Education Data System (IPEDS), which contains information on enrollment, finances, institutional characteristics, and degrees awarded. In addition, information from the College Board's Annual Survey of Colleges was also included. The combination of longitudinal data, postsecondary transcripts, and institutional data provided a rich and unique source of information with which to explore the research questions.

A series of statistical analyses were performed that permitted assessing the net effect of college characteristics on 1991 annual earnings, controlling for differences in student background, labor market characteristics, and higher education experiences, such as grade-point average and major field of study. The results were examined in two ways: first, the contribution of college characteristics to explaining variance in earnings among college graduates (incremental R^2), and second, the estimated dollar effects over the course of a working life.

College Characteristics Overall

Overall, the net contribution of college characteristics to variance in men's earnings was relatively small, ranging from 2 to 3 percent (table A), somewhat less than the net effect of background characteristics on earnings. Higher education experiences accounted for substantially more variance in men's earnings than either college characteristics or background characteristics (12 percent).

A different picture emerged for women. Institutional characteristics explained more of the variance in female earnings than they did in male earnings. The incremental R^2 for women ranged from 5 to 6 percent after controlling for

Table A.—Estimated contributions of institutional characteristics, higher education experiences, student background characteristics, and student occupation and industry to variance in the 1991 earnings of 1980 high school sophomores, by gender

	Percent variance after applying various controls		
	(A) controlling for institutional, labor market, and student background characteristics	(B) controlling for (A), plus higher education experiences	(C) controlling for (B), plus student occupation and industry
Incremental R^2 for men*			
Institutional characteristics	2.8	2.0	2.0
Higher education experiences	(†)	12.3	4.3
Background characteristics	3.9	3.4	3.1
Incremental R^2 for women*			
Institutional characteristics	5.5	5.4	4.1
Higher education experiences	(†)	5.7	3.0
Background characteristics	2.5	2.2	1.7

† Not applicable.

*All men and women in the samples were 1980 high school sophomores who had earned a bachelor's degree by 1990, who were not enrolled in graduate school in 1991, and who had positive earnings in 1991. The incremental R^2 is the change associated with including a particular group of variables in a regression model, compared with not including that group. For details about the models and variables used in these analyses, see the complete report.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:1980/1992) and 1987 Integrated Postsecondary Education Data System (IPEDS). The College Board, 1985–86 Annual Survey of Colleges. (Excerpted and adapted from tables 2 and 3 on pp. 24–29 of the original report from which this article is excerpted.)

background characteristics, labor market characteristics, and higher education experiences.

Higher Education Experiences, Including Choice of Major

For both men and women, choice of major was associated with later earnings. The results suggest that the primary mechanism linking major field of study and earnings was the association between major and occupation. For men, controlling for occupation and industry reduced the explained variance attributable to higher education experiences from 12 percent to 4 percent, while the variance accounted for by institutional characteristics remained at 2 percent. For women, however, the pattern was somewhat different. In contrast to men, for whom higher education experiences accounted for almost six times as much variance as institutional characteristics (12 percent vs. 2 percent before controlling for occupation and industry), for women, higher education experiences and institutional characteristics were almost equally important in affecting earnings (4 percent vs. 5 percent). After including information about occupation and industry, the explained variance attributable to higher education experiences fell from 6 to 3 percent. Institutional characteristics still explained about 4 percent of the variance in women's earnings.

Specific College Characteristics

Among the college characteristics that mattered for men was attending a selective versus a nonselective institution. Obtaining a degree from a selective institution—as measured by the Cooperative Institutional Research Project rating for colleges and universities, based on standardized test scores of incoming freshmen—was associated with an earnings increment of 11 to 16 percent. Men also benefited from attending institutions with higher per capita spending on instruction.

For women, a different kind of institutional selectivity (measured by the ratio of applicants to admissions) was associated with higher earnings. A unit increase in this ratio was associated with about a 12 percent increase in earnings. Attending a selective liberal arts college and attending an institution located in the Mid-Atlantic region or New England also had significant positive effects on women's earnings.

Although college characteristics appeared to account for a relatively small proportion of the total variance in earnings for men, and somewhat more but still relatively little for women, they were nonetheless quite important. For men, attending a college whose characteristics were one standard

deviation above the average* was estimated to be worth an additional $2,311 in annual earnings, or an 8.1 percent increase above the average of $28,567. For women, the comparable increment was $3,746, or a 17.4 percent increase above the average of $21,590. These effects are comparable to the estimated effect of attending an additional year of college.

Conclusion

The results of these analyses should offer some consolation to students and their families as they sit down to decide where to attend college. Although differences among colleges can have a large effect on lifetime earnings, decisions that students make (especially major field of study) have substantial effects on later labor market outcomes regardless of which college they attend. From this perspective, students may choose to avail themselves of the least expensive alternative that provides the major in which they are interested.

*For this analysis, a composite institutional characteristics variable was constructed for each college.

Data sources: The NCES High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:1980/1992) and 1987 Integrated Postsecondary Education Data System (IPEDS). The College Board's 1985–86 Annual Survey of Colleges.

For technical information, see the complete report:

Fitzgerald, R.A. (2000). *College Quality and the Earnings of Recent College Graduates* (NCES 2000–043).

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For questions about content, contact Shelley Burns (*shelley_burns@ed.gov*).

To obtain the complete report (NCES 2000–043), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site (*http://nces.ed.gov*), or contact GPO (202–512–1800).

Public Libraries in the United States: FY 1997
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Public Libraries in the United States: FY 1997

Adrienne Chute and P. Elaine Kroe

This article was originally published as the Introduction and Highlights of the E.D. Tabs report of the same name. The universe data are from the NCES Public Libraries Survey (PLS).

Introduction

The 41 tables in this report summarize information about public libraries in the 50 states and the District of Columbia for state fiscal year (FY) 1997.[1] The data were collected through the Public Libraries Survey (PLS), conducted annually by the National Center for Education Statistics (NCES) through the Federal-State Cooperative System (FSCS) for Public Library Data. The FY 1997 survey is the 10th in the series.

FSCS is a cooperative system through which states and the outlying areas submit individual public library data to NCES on a voluntary basis. At the state level, FSCS is administered by State Data Coordinators (SDCs) appointed by the Chief Officers of State Library Agencies (COSLA). The SDC collects the requested data from public libraries and submits these data to NCES. NCES aggregates the data to provide the state and national totals presented in this report. All 50 states and the District of Columbia submitted data for FY 1997. Requests for data were sent to the following outlying areas: Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, Republic of Palau, and the U.S. Virgin Islands. Only data for the Northern Mariana Islands are included in this report.[2]

This report includes information about service measures such as access to the Internet and other electronic services, reference transactions, public service hours, interlibrary loans, circulation, library visits, children's program attendance, and circulation of children's materials. It also includes information about size of collection, staffing, operating income and expenditures, type of legal basis, type of administrative structure, and summary information about the number and type of public library service outlets. Data were imputed for nonresponding libraries.

Number of Public Libraries and Their Service Outlets and Legal Basis

Number of libraries and population served

There were 8,967 public libraries (administrative entities) in the 50 states and the District of Columbia in FY 1997. Eleven percent of the public libraries served 71 percent of the population of legally served areas in the United States; each of these public libraries had a legal service area population of 50,000 or more.

Administrative structure and service outlets

Eighty percent of public libraries had one single direct service outlet (an outlet that provides service directly to the public). Twenty percent had more than one direct service outlet. This report includes information about three types of direct public library service outlets: branch library outlets, central library outlets,[3] and bookmobile outlets. A total of 1,487 public libraries (17 percent) had one or more branch library outlets, with a total of 7,147 branches. The total

[1] In six states (Illinois, Michigan, Nebraska, Pennsylvania, Texas, and Vermont), some libraries reported data for FY 1996.

[2] The other outlying areas are not included due to survey follow-up problems. NCES is working with the other outlying areas and hopes to be able to include their data in future years.

[3] A central library outlet is either a single-outlet library or a library that is the operational center of a multiple-outlet library.

number of central library outlets was 8,943. Thus, the total number of stationary outlets (central library outlets and branch library outlets) was 16,090. Nine percent of public libraries had one or more bookmobile outlets, with a total of 947 bookmobiles.

Legal basis and interlibrary relationships

Fifty-four percent of public libraries were part of a municipal government, 12 percent were part of a county or parish, and 6 percent had multijurisdictional legal basis under an intergovernmental agreement. Eleven percent were nonprofit association or agency libraries, 3 percent were part of a school district, and 8 percent were separate government units known as library districts. One percent were combinations of academic/public libraries or school/public libraries. Six percent reported their legal basis as "other."

Seventy-three percent of public libraries were members of a system, federation, or cooperative service, while 24 percent were not. Four percent served as the headquarters of a system, federation, or cooperative service.

Operating Income and Expenditures

Operating income

In FY 1997, 78 percent of public libraries' total operating income of about $6.3 billion came from local sources, 12 percent from the state, 1 percent from federal sources, and 9 percent from other sources, such as gifts and donations, service fees, and fines.

Nationwide, total per capita[4] operating income for public libraries was $24.48. Of that, $19.00 was from local sources, $2.97 from state sources, $.22 from federal sources, and $2.28 from other sources. Per capita operating income from local sources was under $3.00 for 11 percent of public libraries, $3.00 to $14.99 for 45 percent of libraries, $15.00 to $29.99 for 29 percent, and $30.00 or more for 15 percent.

Operating expenditures

Total operating expenditures for public libraries were $5.9 billion in FY 1997. Of this, 64 percent was expended for paid staff and 15 percent for the library collection.

[4]Per capita figures are based on the total unduplicated population of legal service areas in the states, not on the total population of the states.

Thirty-six percent of public libraries had operating expenditures of less than $50,000, 39 percent expended between $50,000 and $399,999, and 25 percent expended $400,000 or more. The average U.S. per capita operating expenditure for public libraries was $22.88. The highest average per capita operating expenditure in the 50 states and the District of Columbia was $40.19 and the lowest was $9.85.

Expenditures for materials in electronic format[5] were 1 percent of total operating expenditures for public libraries. Expenditures for electronic access[6] were 3 percent of total operating expenditures.

Staffing and Collections

Staffing

Public libraries had a total of 120,750 paid full-time-equivalent (FTE) staff, or 11.8 per 25,000 population in FY 1997. Of these, 23 percent, or 2.7 per 25,000 population, were librarians with the ALA-MLS,[7] and 10 percent were librarians by title but did not have the ALA-MLS. Sixty-seven percent of the staff were in other positions.

Collections

Nationwide, public libraries had 723 million books and serial volumes in their collections, or 2.8 volumes per capita. By state, the number of volumes per capita ranged from 1.6 to 5.4. In addition to printed materials, public libraries nationwide had collections of 27 million audio materials and 15 million video materials. Nationwide, public libraries provided 3.9 materials in electronic format (e.g., CD-ROMs, magnetic tapes, and magnetic disks) per 1,000 population.

[5]Operating expenditures for library materials in electronic format are expenditures for materials considered part of the collection, whether purchased or leased, such as CD-ROMs, magnetic tapes, and magnetic disks that are designed to be processed by a computer or similar machine. Examples are U.S. Census data tapes, locally mounted databases, serials, and reference tools. Included are operating expenditures for equipment when the cost is inseparably bundled into the price of the information service product. Excluded are operating expenditures for library system software and microcomputer software used only by the library staff.

[6]Operating expenditures for electronic access are operating expenditures from the library budget associated with access to electronic materials and services. Included are expenditures for the following: computer hardware and software used to support library operations, whether purchased or leased; mainframes and microcomputers; maintenance; and equipment used to run information service products when those expenditures can be separated from the price of the product. Expenditures for services provided by national, regional, and local bibliographic utilities, networks, consortia, and commercial services are reported, as well as all fees and usage costs associated with such services as Online Computer Library Center (OCLC) FirstSearch or electronic document delivery.

[7]Librarians with master's degrees from programs of library and information studies accredited by the American Library Association (ALA).

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Services

Internet access and other electronic services

Nationwide, 79 percent of public libraries provided access to the Internet and 66 percent provided access to electronic services.[8]

Circulation

In FY 1997, total nationwide circulation of public library materials was 1.7 billion, or 6.6 per capita. The highest statewide circulation per capita in the 50 states and the District of Columbia was 12.6 and the lowest was 2.7.

Other service measures

Nationwide,

- 11.7 million library materials were loaned by public libraries to other libraries;
- reference transactions in public libraries totaled 287 million, or 1.1 per capita; and
- library visits in public libraries totaled 1.1 billion, or 4.1 per capita.

Children's services

Nationwide, circulation of children's materials was 596 million, or 35 percent of total circulation. Attendance at children's programs was 43 million.

[8]Electronic access refers to electronic services (e.g., bibliographic and full-text databases, multimedia products) provided by library subscription, lease, license, consortial membership or agreement. It includes full-text serial subscriptions and electronic databases received by the library or an organization associated with the library.

Data source: The NCES FY 1997 Public Libraries Survey (PLS).

For technical information, see the complete report:

Chute A., and Kroe, P.E. (2000). *Public Libraries in the United States: FY 1997* (NCES 2000–316).

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To obtain the complete report (NCES 2000–316), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site *(http://nces.ed.gov).*

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Educational Attainment
from The Condition of Education: 1999 73

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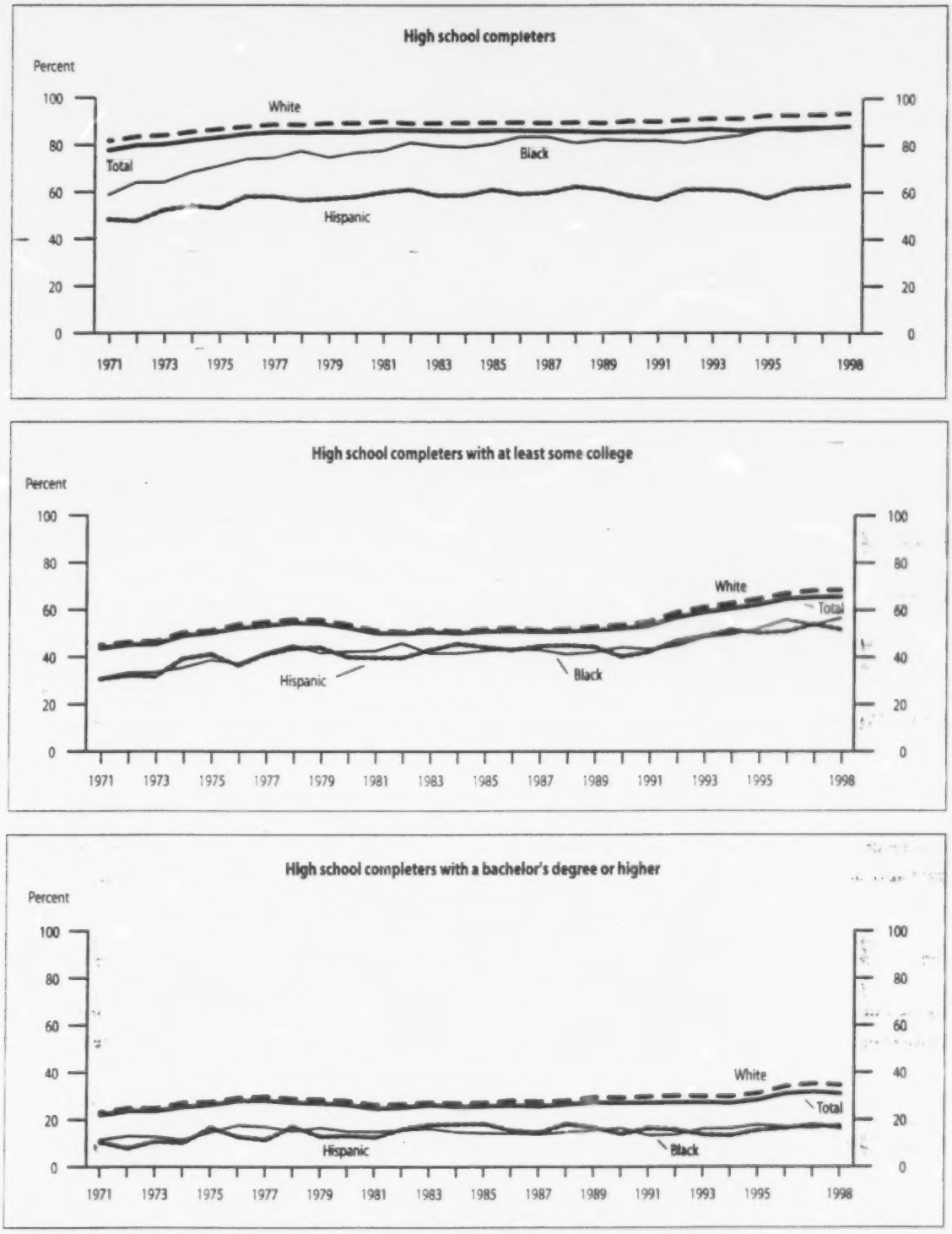
Educational Attainment

This article was originally published as an Indicator of the Month, taken from* The Condition of Education: 1999. *The sample survey data are from the U.S. Census Bureau's March Current Population Survey (CPS).

Changes in educational attainment over time indicate fluctuations in the demand for skills and knowledge in the workforce as well as societal changes. An increase in the overall level of educational attainment can reflect the increasing emphasis society places on completing high school and college. Completing high school or college is an important educational accomplishment that yields many benefits, such as better job opportunities and higher earnings.

- The educational attainment of 25- to 29-year-olds increased between 1971 and 1998. The percentage with a high school diploma or equivalency certificate rose from 78 to 88 percent; the percentage of high school completers with at least some college rose from 44 to 66 percent; and the percentage of high school completers with a bachelor's degree or higher rose from 22 to 31 percent (table 1 and figure 1).
- The educational attainment of blacks ages 25–29 increased across all education levels between 1971 and 1998. During this period, the rates of high school completion became more similar for blacks and whites. In 1971, blacks ages 25–29 completed high school at a rate that was 72 percent of the rate of whites, while in 1998 the high school completion rate for blacks was 94 percent of the rate of whites. In contrast, the gaps in attainment between white and black high school completers with at least some college remained about the same, and the gap for those with a bachelor's degree or higher widened.
- The educational attainment of Hispanics ages 25–29 increased across all levels between 1971 and 1998. However, despite these increases, the gaps in attainment between Hispanics and whites remained similar at every attainment level during this period.
- In 1971, females ages 25–29 had lower rates of attainment at every education level than their male peers. However, between 1971 and 1998, the educational attainment of females increased at a faster rate than that of males, and by 1998, the attainment rate of females surpassed that of their male peers.

Figure 1.—Percentage of 25- to 29-year-olds who completed high school and percentage of high school completers with at least some college or a bachelor's degree or higher, by race/ethnicity: March 1971–98



NOTE: The Current Population Survey (CPS) questions used to obtain educational attainment were changed in 1992. In 1994, the survey instrument for the CPS was changed and weights were adjusted. Included in totals, but not shown separately, are other racial/ethnic groups.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), March 1971–98.

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Table 1.—Percentage of 25- to 29-year-olds who completed high school and percentage of high school completers with at least some college or a bachelor's degree or higher, by race/ethnicity: March 1971–98

					High school completers with							
	High school diploma or equivalency certificate				At least some college				Bachelor's degree or higher			
March	Total	White	Black	Hispanic	Total	White	Black	Hispanic	Total	White	Black	Hispanic
1971	77.7	81.7	58.8	48.3	43.6	44.9	30.9	30.6	22.0	23.1	11.5	10.5
1973	80.2	84.0	64.1	52.3	45.3	46.6	33.5	31.6	23.6	24.8	12.7	10.8
1975	83.1	86.6	71.1	53.1	50.1	51.2	38.7	41.1	26.3	27.5	14.7	16.6
1977	85.4	88.6	74.5	58.0	53.2	54.8	41.7	41.1	28.1	29.8	16.9	11.5
1979	85.6	89.2	74.7	57.1	54.1	55.7	41.7	44.0	27.0	28.6	16.6	12.9
1981	86.3	89.8	77.6	59.8	50.1	51.2	42.5	39.6	24.7	26.3	14.9	12.5
1983	86.0	89.3	79.5	58.4	50.6	51.6	41.6	42.9	26.2	27.4	16.2	17.8
1985	86.2	89.5	80.5	61.0	50.8	51.8	42.7	44.2	25.7	27.3	14.4	18.2
1987	86.0	89.4	83.5	59.8	50.7	51.4	43.0	44.6	25.6	27.6	13.8	14.5
1989	85.5	89.3	82.3	61.0	51.3	52.8	42.1	44.3	27.3	29.5	15.4	16.5
1991	85.4	89.8	81.8	56.7	53.1	54.9	43.2	42.2	27.2	29.7	13.4	16.3
1992	86.3	90.6	80.9	60.9	56.7	58.8	44.7	46.8	27.3	30.0	13.7	15.6
1993	86.7	91.2	82.7	60.9	58.9	61.0	48.4	48.8	27.3	29.8	16.1	13.6
1994	86.1	91.1	84.1	60.3	60.5	62.7	49.6	51.5	27.0	29.7	16.2	13.3
1995	86.9	92.5	86.8	57.2	62.2	64.6	52.0	50.3	28.4	31.2	17.8	15.5
1996	87.3	92.6	86.0	61.1	64.7	67.0	55.9	50.9	31.1	34.1	17.0	16.4
1997	87.4	92.9	86.9	61.8	65.4	68.2	53.7	53.9	31.8	35.2	16.4	17.8
1998	88.1	93.6	88.2	62.8	65.6	68.5	56.6	51.7	31.0	34.5	17.9	16.5

NOTE: The Current Population Survey (CPS) questions used to obtain educational attainment were changed in 1992. In 1994, the survey instrument for the CPS was changed and weights were adjusted. Included in totals, but not shown separately, are other racial/ethnic groups.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), March 1971–98 (selected years).

Data source: U.S. Bureau of the Census, Current Population Survey (CPS), March 1971–98.

For technical information, see

National Center for Education Statistics. (1999). *The Condition of Education: 1999* (NCES 1999–022).

For complete supplemental and standard error tables, see either

- the electronic version of *The Condition of Education: 1999 (http://nces.ed.gov/pubs99/condition99/)*, or
- volume 2 of the printed version: *The Condition of Education: 1999 Supplemental and Standard Error Tables* (NCES 2000–016).

For questions about content, contact John Wirt *(john_wirt@ed.gov)*.

To obtain this Indicator of the Month (NCES 2000–010), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site *(http://nces.ed.gov)*.

The Condition of Education: 2000

This article was taken from the Statement of Gary W. Phillips, Acting Commissioner of Education Statistics, on the release of the Compendium of the same name on June 1, 2000. The universe and sample survey data are from various studies carried out by NCES, as well as surveys conducted elsewhere, both within and outside of the federal government.

Introduction

A high-quality educational system is key to the well-being of our nation and its people, and reliable data are critical in guiding efforts to improve education in America. When the original Department of Education was created in 1867, the law stated that it should "gather statistics and facts on the condition and progress of education in the United States and Territories." The National Center for Education Statistics (NCES) currently carries out this mandate for the Department of Education. *The Condition of Education*, a congressionally mandated annual report submitted to Congress on June 1 every year, addresses this central NCES mission.

Drawing on numerous NCES surveys and other data sources, this annual report presents indicators of important developments and trends in American education. Recurrent themes underscored by the indicators include academic excellence, equity of access, and new challenges. This year's edition of *The Condition of Education* contains 67 separate indicators. Each indicator focuses on a single facet of the American educational system. Together, the indicators present a complex picture of education in our nation at the turn of the millennium. Key elements of this picture include the

- importance of education;
- increasing numbers and diversity of students;
- differences in skills and knowledge among students, even as they begin kindergarten; and
- positive trends and continuing challenges that relate to student performance.

Education Is Important

Ideally, education should help all Americans to gain knowledge and intellectual enrichment, to adapt rapidly to an ever-changing workplace, and to function as responsible citizens. It should also benefit society as a whole—for example, by promoting the health of our democratic system and the competitiveness of our nation in today's technology-driven global economy. The information presented in *The Condition* indicates that educational attainment is, in fact, associated with increases in lifetime learning, civic participation, and economic returns.

Lifetime learning

NCES survey results suggest that a strong educational foundation encourages people to continue learning throughout their lives. Thus, the percentage of adults taking classes (e.g., organized training, courses, seminars) increases with each level of educational attainment. In 1999, for example, adults with a college degree were about 60 percent more likely to take classes than adults with a high school diploma.

Civic participation

Data also confirm a link between educational attainment levels and levels of civic participation. In the 1996 presidential election, for example, college graduates ages 25–44 were 70 percent more likely to vote than high school graduates in the same age group. High school dropouts were about 50 percent less likely to vote than high school graduates. Although voting rates dropped at all educational levels between 1964 and 1996, the decline was generally greater among those with less education (figure A).

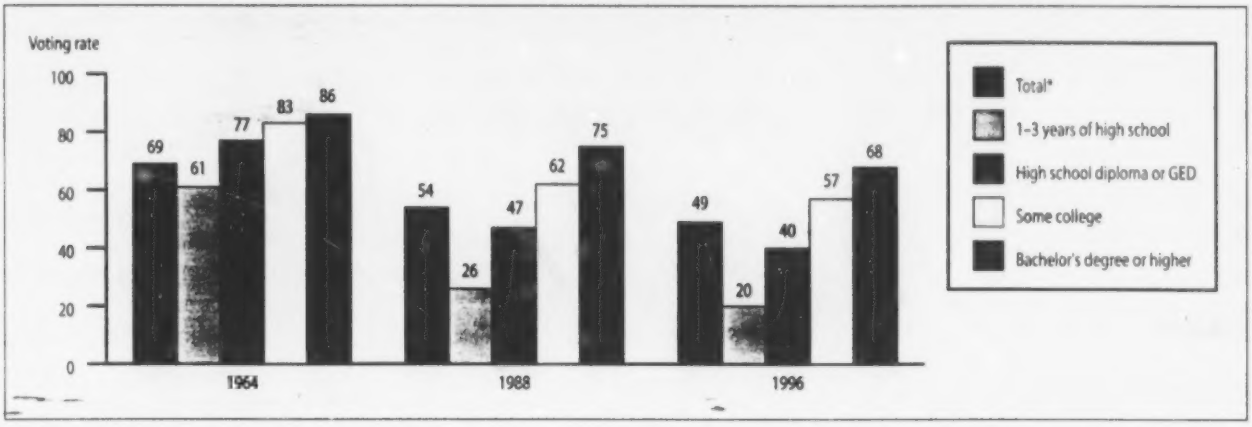
Economic returns

As for monetary returns, the relative value of a college degree has never been higher. Between 1980 and 1998, the earnings of 25- to 34-year-olds who had at least a bachelor's degree increased markedly relative to the earnings of their peers who had only a high school diploma. Among men in this age group, the earnings advantage of college graduates over high school graduates grew from 19 percent in 1980 to 56 percent in 1998. Among women, the earnings advantage grew from 52 percent in 1980 to 100 percent in 1998. Thus, the economic benefit of a college degree is even greater for women than for men. For both men and women, the negative economic effect of dropping out of high school has continued over time.

Enrollments and Diversity Are Increasing

Enrollments are growing at all levels of education, but for different reasons. At the preprimary level, growth is due to higher rates of enrollment; that is, larger percentages of

Figure A.—Voting rates for presidential elections for the population ages 25–44, by highest level of education completed: 1964, 1988, and 1996



*Includes those with less than 9 years of education.

NOTE: In 1992, the Current Population Survey (CPS) changed the questions used to obtain educational attainment. The voting rate is calculated as the numbers of voters ages 25–44 divided by the total population in the same age group.

SOURCE: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, "Voting and Registration in the Election of November" (various years), series P-20, Nos. 143, 440, and 504. (Originally published as the Voting Participation figure on p. 33 of the complete report.)

3- to 5-year-old children are enrolling in school. At the elementary and secondary levels, growth is due to demographic changes, which are also making the student body more diverse. At the postsecondary level, higher enrollment rates and population growth are combining to swell enrollments.

Increasing enrollment rates of 3- to 5-year-olds

Enrollment rates are growing fastest among America's youngest students (figure B). Between 1970 and 1998, the proportion of 3- to 5-year-olds who were enrolled grew from 38 percent to 65 percent. This growth corresponds with both an increase in the percentage of working mothers and a growing awareness of the benefits of high-quality early childhood education, particularly for disadvantaged children.

Because preprimary education may help lay a foundation for success in elementary school, many people are concerned about equal access to education at this level. While data on preprimary enrollment rates among various groups of children do not address the issue of quality, they do at least provide information about access to preprimary education. The data on 1999 enrollments are mixed. For example, black children were more likely to be enrolled in preprimary education than white or Hispanic children. While poor white 3- and 4-year-olds did not participate in preprimary education at as high a rate as nonpoor white children in the same age group, black and Hispanic children in poverty were just as likely to be enrolled as those above the poverty level. Overall, children's enrollment rates increased with their parents' levels of educational attainment.

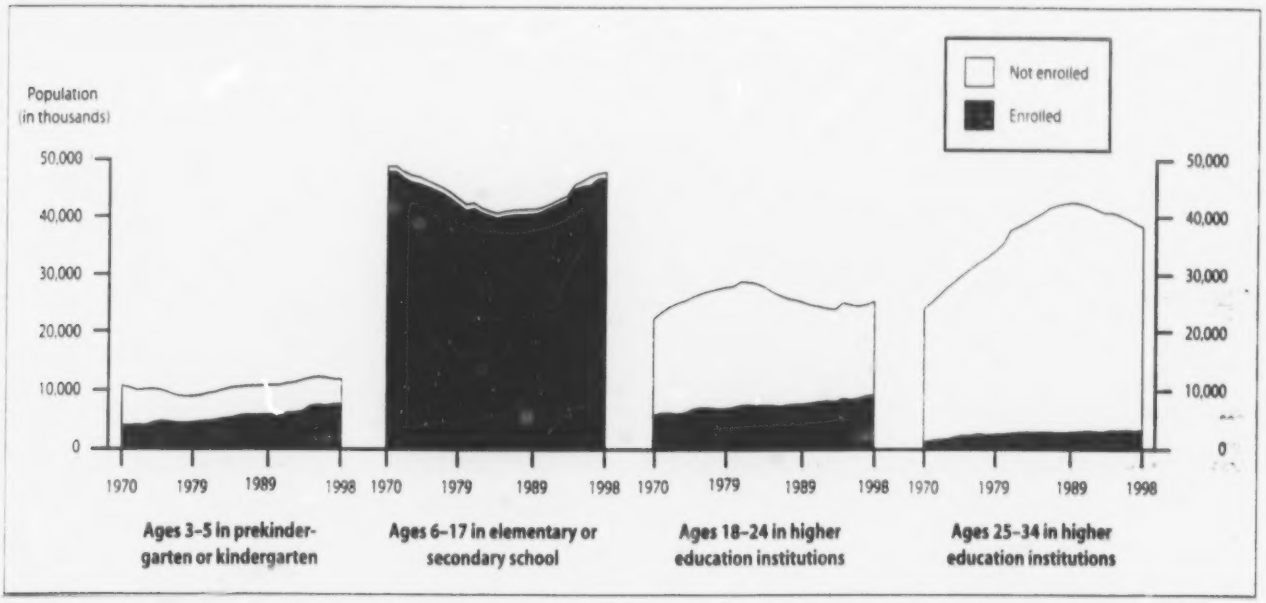
Increasing population growth and diversity of 6- to 17-year-olds

Because elementary and secondary education is mandatory, most 6- to 17-year-olds (about 98 percent) are enrolled (figure B). Despite a steady enrollment rate, however, demographic changes are causing increases in both the number and the diversity of public school students in this age group. One demographic change affecting enrollments is the baby boom echo, that is, the growth in the number of births that began in the mid-1970s and peaked in 1990. Another influence is the growth in the number of immigrants over the past 2 decades.

As a result of the baby boom echo combined with immigration, the population in the 6- to 17-year-old age group has been increasing since 1985. So far, the resulting wave of enrollments has hit hardest at the elementary and middle school levels. Between 1985 and 1999, public school enrollments in grades 1–8 rose by 24 percent. During the same period, enrollments increased by 9 percent in grades 9–12. These enrollment increases have intensified the need for public school staff, classroom space, and equipment.

Between 1999 and 2009, growth in public school enrollments is expected to be concentrated in the secondary grades, which will experience an additional 9 percent

Figure B.—Number of enrolled and not enrolled people ages 3–34, by level: October, 1970–98



NOTE: Prekindergarten includes only nursery schools. "Higher education" includes regular programs in 2- and 4-year colleges and universities. Comparable data were not available for children ages 3 and 4 in 1990 due to changes in survey procedures. In 1994, the survey methodology for the Current Population Survey (CPS) was changed and weights were adjusted. Enrollment estimates exclude the following: children ages 3–5 enrolled in elementary school or higher; children ages 6–17 enrolled in prekindergarten, kindergarten, or higher education institutions; and adults ages 18–34 enrolled in school below the higher education institution level. These groups are included in the estimates for "not enrolled."

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey (CPS), October, 1970–98. (Originally published as the Education Enrollment figure on p. 6 of the complete report.)

increase by 2009. The majority of this growth is expected to occur in the West and in the South.

In addition to accommodating larger numbers of students, public schools must meet the challenges of increased racial/ethnic and language diversity. Between 1972 and 1998, the proportion of U.S. public school students in grades 1–12 who were considered part of a minority group rose from 22 percent to 37 percent. This increase occurred largely because of rapid growth in the proportion of Hispanic students—from 6 percent of all public school students in 1972 to 15 percent in 1998. The proportion of Hispanic students in the West reached 30 percent in 1998. In the same year, the West had a higher proportion of minority students—48 percent—than any other part of the country.

Increasing enrollment rates and population growth of 18- to 24-year-olds

For the past 3 decades, postsecondary enrollments have generally increased (figure B). During the 1970s, growth in postsecondary enrollments was fueled by an increase in the traditional college-age population (18- to 24-year-olds). Despite a decrease in this population during the 1980s, postsecondary enrollments continued to grow because of rising rates of enrollment in this age group. During the 1990s, when the college-age population began increasing again due to the baby boom echo, enrollment rates in this age group continued to rise. By 1998, 37 percent of all 18- to 24-year-olds were enrolled in college, up from 26 percent in 1980. Enrollment rates have risen even more quickly among women, who increased their overall share of postsecondary enrollments from 41 percent in 1970 to 57 percent in 1998.

Postsecondary enrollment rates are higher among the traditional college-age population than among any other age group. Projections for the next decade show these rates rising from their current high levels, while the college-age population increases substantially. As a result, postsecondary enrollments are expected to grow by about 10 percent between 1999 and 2009. Because most college students in the traditional age group attend full time, the number of full-time students is expected to grow at least three and one-half times faster than the number of part-time students.

Record-setting postsecondary enrollments are likely to continue. Postsecondary institutions may adopt a variety of

strategies to deal with the record numbers of students. In addition to expanding the staff and facilities used for traditional education, institutions may use distance education to meet some of the demand. Already, increasing numbers of institutions—particularly those in the public sector—are offering distance education courses. Between fall 1995 and the 1997–98 academic year, for example, the proportion of public 4-year institutions offering such courses grew from 62 percent to 79 percent. In 1997–98, moreover, an additional 12 percent of public 4-year institutions planned to offer such courses within the next 3 years. In contrast to the 91 percent of public 4-year institutions with offerings or plans to offer distance education courses, private 4-year institutions were much less likely to offer distance education courses. In 1997–98, 47 percent of these institutions either offered such courses or planned to do so within the next 3 years.

Changing patterns of participation in postsecondary education

Not only are more high school graduates enrolling in college, but more of them are doing so in the fall immediately after they complete high school. In 1998, 66 percent of high school graduates enrolled in college immediately, compared with 49 percent in 1972. Between 1972 and 1998, the immediate enrollment rate increased faster for women than for men. Since 1984, the rate of immediate enrollment has also grown faster for blacks than for whites, reducing the gap between these groups. By 1998, 62 percent of black high school graduates were enrolling in postsecondary institutions immediately after high school. However, some gaps in immediate enrollment rates—such as the gap between high- and low-income students—have persisted. In 1998, 77 percent of high school graduates from high-income families enrolled in college immediately, compared with 46 percent of those from low-income families.

Many Children Start Kindergarten With Basic Skills, but Performance Gaps Are Already Apparent

As children start kindergarten, differences are already apparent in their skills and knowledge. Such differences are associated with many of the same characteristics that relate to the academic performance and educational attainment of older students.

Basic skills and knowledge at the beginning of kindergarten

By the time children get to kindergarten, they are already developing basic skills related to reading and mathematics. In the fall of 1998, for example, 94 percent of beginning kindergartners could recognize single-digit numbers and basic shapes. In addition, the majority could recognize the letters of the alphabet and were able to count beyond 10 and compare the relative lengths of objects. Fewer beginning kindergartners had attained higher levels of proficiency. For example, only 4 percent could solve simple addition and subtraction problems.

Differences in basic skills and knowledge at the beginning of kindergarten

Beginning kindergartners' proficiency levels and average performance in reading and mathematics varied with characteristics such as their race/ethnicity, family income level, and mothers' educational attainment. For example, children's average performance increased with the level of their mothers' education (figure C). Nevertheless, some children whose mothers had less than a high school education showed high levels of reading and mathematics skills, with 6 percent scoring in the highest quartile in reading and 7 percent in the highest quartile in mathematics. The Early Childhood Longitudinal Study (ECLS) will follow these beginning kindergartners and their peers through the fifth grade, enabling us to document—among other things—whether the performance gaps between various groups of children widen or narrow with further education. This study holds great promise for increasing our understanding of which features of the home, preschool, and elementary school environments can help all children—including those with risk factors—perform to their fullest potential.

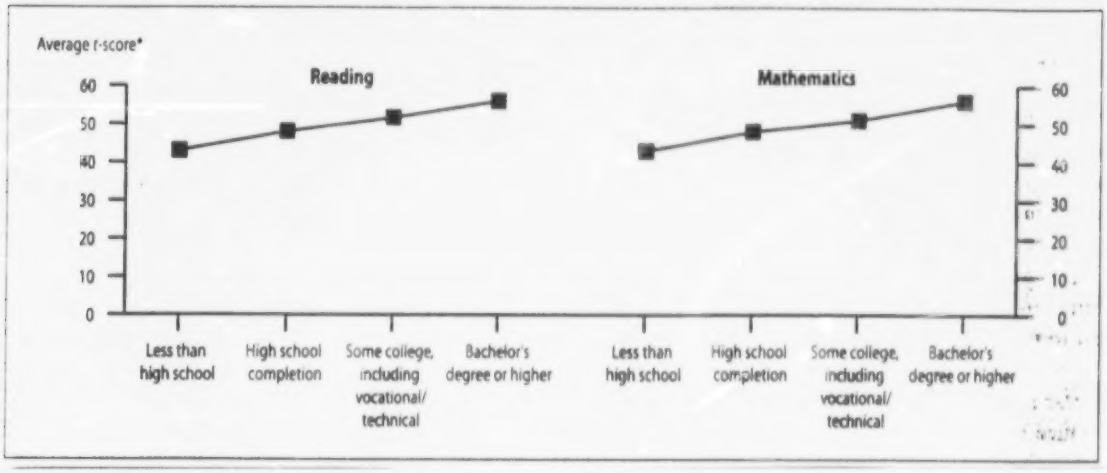
Performance in Grades 1–12 Is Improving, but Concerns Persist

At the elementary and secondary levels, trends in student performance and course taking are generally positive. But issues of equal educational opportunity and international competitiveness remain.

Improved or unchanged reading performance

Between 1971 and 1996, 9- and 13-year-olds improved their performance on the National Assessment of Educational Progress (NAEP) long-term trend assessment in reading. During the same period, little change occurred in the performance of 17-year-olds. In all three age groups, female students outscored male students, and white students outscored black and Hispanic students. The score gap between black and white students narrowed between the early 1970s and the mid-1980s, but then remained fairly stable. The relative performance of females compared with

Figure C.—Average reading and mathematics performance of first-time kindergartners, by mother's highest education level: Fall 1998



*t-scores normalize the actual distribution to an average of 50 and a standard deviation of 10.

NOTE: Based on those assessed in English. Excludes 19 percent of Asian and 30 percent of Hispanic children.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K), Fall 1998. (Originally published as the Learner Outcomes figure on p. 22 of the complete report.)

males and of whites compared with Hispanics did not change significantly between the 1970s and 1996.

Improved mathematics and science performance

Between the late 1970s and 1996, 9-, 13-, and 17-year-olds all improved their performance on the NAEP long-term trend assessments in mathematics and science. During this period, white students scored higher than black and Hispanic students, but the black-white score gap narrowed in both mathematics and science. The Hispanic-white score gap narrowed for 13- and 17-year-olds in mathematics, but showed little change for any age group in science. The mathematics scores of male students did not differ significantly from those of female students. In science, male students outscored female students, although the male-female gap narrowed for 17-year-olds.

On the long-term trend assessments, a score of 300 or higher indicates high performance in a subject area and demonstrates a student's ability to think critically and apply reasoning, analytical, and problem-solving skills. The improvements in mathematics and science performance between the late 1970s and 1996 included increases in the percentages of 17-year-olds scoring at this high level. In mathematics, the percentage of 17-year-olds scoring at or above 300 increased from 52 percent in 1978 to 60 percent in 1996. In science, the percentage increased from 42 percent in 1977 to 48 percent in 1996.

Increased course taking in advanced mathematics and science

Overall improvement in mathematics and science performance has been accompanied by increased participation in advanced mathematics and science courses (figure D). Between 1982 and 1998, for example, the percentage of graduating high school students who had completed courses at either of the two highest levels of mathematics (including such courses as trigonometry, precalculus, and calculus) increased from 11 percent to 27 percent. Over the same period, the percentage of graduating students who had completed either of the two highest levels of science (consisting of a chemistry course plus a physics course, or one advanced-level course in either subject) increased from 12 percent to 26 percent. Graduates who met the requirements of the core New Basics curriculum—i.e., 4 years of English, plus 3 years each of social studies, science, and mathematics—were more likely to have completed advanced courses than graduates who did not meet these requirements.

Mathematics and science performance of U.S. students relative to students in other countries

In 1995, international comparisons of performance and curriculum in mathematics and science yielded less positive results, especially at the higher grade levels. U.S. 4th-graders scored above the international average in both mathematics and science. U.S. 8th-graders scored above the

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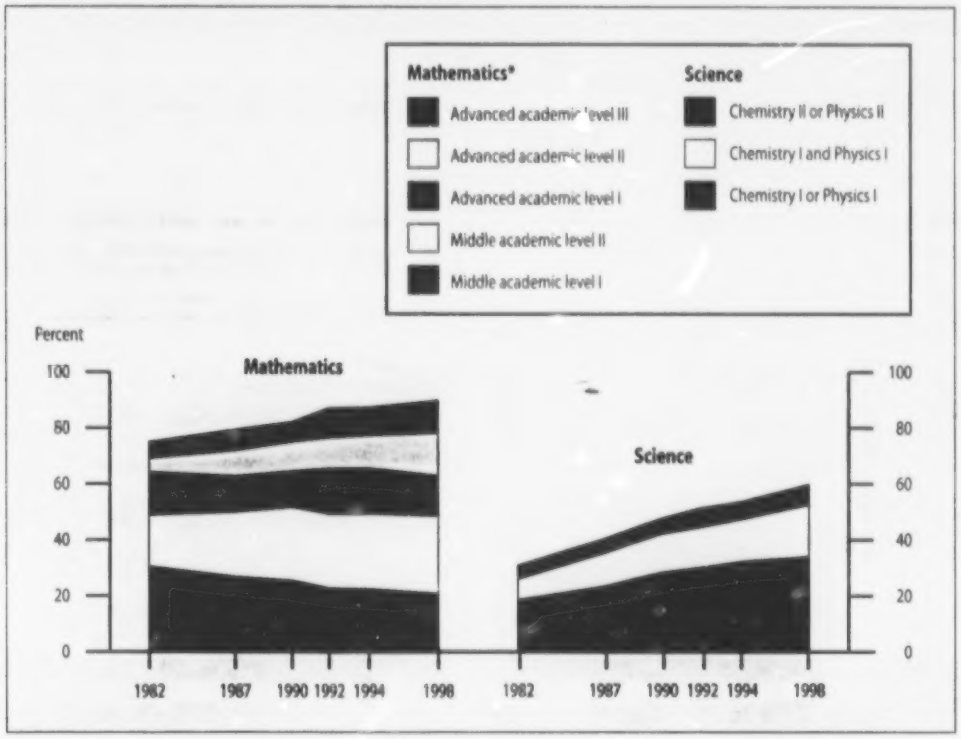
Figure D.—Percentage distributions of high school graduates according to the highest levels of advanced mathematics and science courses taken: Selected years, 1982–98



*Advanced academic level III mathematics consists of Advanced Placement calculus, calculus, and calculus/analytical geometry; advanced academic level II consists of precalculus and introduction to analysis; advanced academic level I includes algebra III, trigonometry, analytical geometry, probability, statistics, and other courses; middle academic level II consists of algebra II and unified mathematics III; and middle academic level I includes algebra I, plane and solid geometry, unified mathematics I and II, pure mathematics, and other courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School and Beyond Longitudinal Study of 1980 Sophomores, "Second Follow-up" (HS&B-So:1980/1984); National Education Longitudinal Study of 1988 Eighth-Graders, "High School Transcript Study" (NELS:1992); and National Assessment of Educational Progress (NAEP), 1987, 1990, 1992, 1994, and 1998 High School Transcript Studies. (Originally published as the Advanced Coursetaking figure on p. 66 of the complete report.)

international average in science but below the average in mathematics. And U.S. 12th-graders scored below the international average in both science and mathematics. In a test of students who had taken advanced mathematics courses, moreover, U.S. 12th-graders scored lower than advanced mathematics students in most of the countries that participated in the test. Similarly, 12th-grade physics students in the United States scored lower on a physics test than their counterparts in all but one of the other participating countries.

Quality of mathematics content in U.S. 8th-grade classes relative to classes in Japan and Germany

The lower performance of U.S. secondary students compared with their peers in other countries may be related to the quality of the U.S. mathematics curriculum. In a 1995 exploratory analysis of videotaped 8th-grade mathematics lessons, the lessons in the United States were more likely to receive the lowest rating for quality of content than the lessons in Germany or Japan, the other two countries participating. Thirty-nine percent of the Japanese lessons and 28 percent of the German lessons received the highest quality rating whereas none of the U.S. lessons received this rating.

Conclusion

In examining trends in the condition of American education, many encouraging signs emerge, including higher rates of educational participation in the overall population as well as increases in mathematics and science

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performance and course taking among high school students. But international comparisons of student performance and instructional quality raise concerns about how well the American educational system compares with the systems of other countries, especially at the secondary level. In addition, disturbing gaps persist in academic performance and educational participation among different racial/ethnic and socioeconomic groups. A growing and increasingly diverse population of elementary and secondary students continues to increase the challenge of providing high-quality instruction and equal educational opportunities.

At the postsecondary level, institutions must prepare for the record numbers of enrollments that are expected over the next few decades.

Data sources: Many studies from NCES and other sources.

For technical information, see the complete report:

National Center for Education Statistics. (2000). *The Condition of Education: 2000* (NCES 2000–062).

For questions about content, contact John Wirt *(john_wirt@ed.gov)*.

To obtain the complete report (NCES 2000–062), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov)*, or contact GPO (202–512–1800).

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Methodology

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Quality Profile for SASS Rounds 1–3: 1987–1995

Graham Kalton, Marianne Winglee, Sheila Krawchuk, and Daniel Levine

This article was excerpted from the first and last chapters of the Technical Report of the same name. The report examines the quality of sample survey data from the NCES Schools and Staffing Survey (SASS) system.

The SASS System

The Schools and Staffing Survey (SASS) is an integrated system of periodic sample surveys providing information about teachers and administrators and the general condition of America's public and private elementary and secondary schools. Sponsored by the National Center for Education Statistics (NCES) of the U.S. Department of Education, SASS offers a source of data for policymakers, educators, education researchers, and the public.

SASS has been conducted three times: round 1 in 1987–88, round 2 in 1990–91, and round 3 in 1993–94. Round 4 is being fielded in the 1999–2000 school year. At each round, NCES reviews the SASS content to expand, retain, or delete topics covered in the previous administration, maintaining the survey's capability for trend analysis while adding new topics to address current concerns. The survey data are collected by mail, with telephone follow-up of nonrespondents.

Each round of SASS includes several core surveys, plus the Teacher Follow-up Survey (TFS), which is conducted the year after the core surveys. In the first two rounds, SASS comprised five components: the "School Survey," the "School Administrator Survey" (now known as the "School Principal Survey"), the "Teacher Demand and Shortage Survey" (TDSS), the "Teacher Survey," and the TFS. In round 3, SASS added the "Library Media Center Survey," the "Library Media Specialist/Librarian Survey," and the "Student Records Survey," resulting in a system of eight surveys in total. Round 4 administers six of these surveys, excluding the "Library Media Specialist/Librarian Survey" and the "Student Records Survey."

Purpose and Content of This Report

This report summarizes what is known about the quality of data from the SASS component surveys and provides information about the survey design and procedures for each survey. More specifically, the report reviews past and ongoing research on the quality of SASS data, with a view to identifying gaps in our knowledge and establishing priorities for future research activities. This information will be of interest to users of SASS data, to persons responsible for various aspects of the design and operation of SASS, and to anyone interested in the quality of survey data, especially data from mail surveys and surveys related to education.

The report draws on a large body of literature and provides references for readers who want more detailed information.

As the second edition of the *Quality Profile for SASS*, this report updates the first edition (Jabine 1994), which covered rounds 1 and 2. The current report discusses rounds 1 through 3. It also mentions some new features of round 4, but does not cover this round, because the round had not yet been completed when the report was prepared.

Each component survey is examined in a separate chapter of the report. Topics discussed for each of the surveys include potential sources of error and their possible impact on the accuracy of survey estimates. The final chapter looks at SASS as a whole, broadening the discussion of quality to cover issues of relevance, accessibility, timeliness, and periodicity. This chapter also combines key findings from earlier chapters to identify areas where efforts for methodological improvements might be most effectively directed and where further information is needed for the assessment of survey quality.

Relevance, Accessibility, and Timeliness of SASS Data

The ultimate goal of conducting SASS is to provide the data required by policymakers and researchers to understand the characteristics of the U.S. elementary and secondary education system. In order to do this, SASS must collect the relevant data, make the results and the data files readily accessible, and provide data that are as up to date as possible.

Relevance

By maintaining close contacts with the broad user community, NCES attempts to ensure that SASS collects the data needed to inform policy decisions and stimulate research. Before each round, NCES enlisted the help of many experts and specialists in the education research and policy communities to examine SASS and propose changes to its content and methods. In addition, the Advisory Council on Education Statistics (ACES)—the advisory panel for NCES—reviewed the plans for SASS at each round, and the SASS Technical Review Panel met regularly to discuss the recommendations made by other groups and to provide a broad evaluation of the plans for survey content, design, analysis, and reporting.

NCES introduced SASS in 1987 in response to needs for information about critical aspects of teacher supply and demand, the qualifications and working conditions of teachers and principals, and the basic conditions in schools as workplaces and learning environments. Although changes in design and procedures were made for round 2, the basic subject content remained essentially unchanged. For round 3, however, some additions and modifications to content were included. For example, the Student Records, Library, and Librarian Surveys were added.

The 6-year period between rounds 3 and 4 provided the opportunity for a major review of the content and purposes of SASS, in light of the many changes in education policy and thinking since its inception. The redesign of SASS engaged many segments of the education research and policy communities. Emerging from diverse redesign efforts, round 4 of SASS shifts emphasis from teacher supply and demand issues to the measurement of teacher and school capacity, both objectives of the recent school reform agenda. To measure teacher capacity, the redesigned SASS examines teacher qualifications, teacher career paths (including induction experience), and professional development. To measure school capacity, SASS concentrates on school organization and decision making, curriculum and instruction, parental involvement, school safety and discipline, and school resources.

Accessibility

The value of a survey depends on the extent to which its data are used, which in turn depends on the accessibility of the survey results and the survey data files. Moreover, the proper use of the survey data requires the availability of good documentation.

Publications. Results from SASS are published in descriptive reports, analytic reports, and issue briefs. The descriptive reports present basic information about schools, principals, and teachers; the analytic reports examine issues of particular interest in more detail; and the issue briefs provide short accounts (about 2 pages) on topics of current concern.

NCES recently conducted a study to explore the satisfaction of key customers with SASS publications by means of individual interviews with 30 selected representatives from state education agencies and 19 other key customers (Rouk, Weiner, and Riley 1999). In general, these customers considered the publications to be easily accessible, the content appropriate for their data needs, and the presentations quite clear. In addition, focus group discussions were held with individuals from federal and state government, research, and data management organizations to obtain reactions concerning the appropriateness, usability, and

accessibility of two key SASS publications: *A Statistical Profile: 1993–94* (Henke et al. 1996) and *SASS by State: 1993–94* (De Mello and Broughman 1996). In general, the comments of the participants on the format and content of SASS tabulations were favorable; they also provided suggestions for additional tabulation detail.

Data files. In addition to the publication of results from SASS, NCES makes microdata available for different or more detailed analyses by users. The public-use data files provided to the public are a subset of the full data set. Because of the need to protect the confidentiality of the respondents, some variables are suppressed and the level of detail for others is reduced. Users who need the full data set for detailed analyses can apply for a license to access the SASS restricted-use data. These unabridged data are not subject to disclosure avoidance procedures and, hence, provide a richer database to support detailed analyses.

Data documentation. To assist users, NCES provides a wide variety of documentation. For each round, a *Data File User's Manual* (NCES 1991a, 1991b, 1991c, 1991d; Faupel, Bobbitt, and Friedrichs 1992; Gruber, Rohr, and Fondelier 1993, 1996; Whitener et al. 1998) provides a comprehensive source of information about each of the surveys that constitute SASS. In similar fashion, a *Sample Design and Estimation* report (Kaufman 1991; Kaufman and Huang 1993; Abramson et al. 1996) provides a detailed description of the sample design and estimation procedures, including variance computation, for each of the surveys in each round. Additional information about SASS procedures and data quality is contained in the many SASS methodological publications.

The current SASS documentation is primarily cross-sectional in nature, providing factual information for each individual round. This form of documentation is well suited to the needs of those who analyze a single round of SASS. Each user's manual contains a brief discussion of changes from the previous round; however, it may not fully satisfy the needs of those who use two or more rounds of SASS data to examine change over time, and of methodologists and others who want to understand and assess the evolution of the SASS methodology. As data from more rounds of SASS become available, interest in documentation that provides a linkage across rounds will increase.

Timeliness and periodicity

Timely production of results. Since the inception of SASS in 1987, significant effort has been devoted toward producing the results in a timely fashion. Experience to date indicates that steady strides have been made in improving timeliness. In round 1, for example, information for principals, schools, and teachers became available about 2 years after the completion of data collection; school district information became available in about 3 years. Each succeeding round has improved on this timing: data from round 2 were first published in January 1993, about 1½ years after the end of data collection, and round 3 publication began in June 1995, only about 12 months after the end of data collection. Plans for round 4 call for the data to become available even sooner, in spring 2001, only some 8 months following completion of data collection.

Factors that have contributed to this positive trend of providing the data more quickly include the growing familiarity with the subject matter, which leads to standardization and greater efficiency in data processing; the repetition of data collection, which permits investment in technology (such as computer-assisted telephone interviewing and computer editing); and improvements in the collection procedures and instruments, which result in more complete returns and a shorter time period required to collect the information. Improvements in data processing also have contributed significantly; specifically, capturing data through imaging rather than data keying and using modular software systems throughout the process have led to accelerated processing.

Periodicity of the surveys. SASS was designed to provide an ongoing and consistent source of data on the teaching workforce and school population. Rounds 1 to 3 of SASS were conducted at 3-year intervals, in 1987–88, 1990–91, and 1993–94. The interval between round 3 and round 4, administered in 1999–2000, was extended to 6 years, in part because of budget limitations. The next round is currently planned for 2003–04, and SASS is to be conducted on a 4-year cycle thereafter, as suggested by a survey of users and discussion by the SASS Technical Review Panel and ACES. The following reasons support this conclusion:

- Because SASS is a unique source of national and state representative data on important topics in education reform, users considered that a 5-year cycle would leave too long a gap for SASS to maintain its currency and provide timely data to support policy planning.
- A 4-year cycle beginning with 1999–2000 and the next administration in 2003–04 would allow SASS to coincide with the cycle of presidential elections and with the reauthorization schedule for the major

elementary and secondary education legislation. This schedule would allow data from SASS to become available around the start of each presidency when the government and policymakers need data to inform the planning of new initiatives.

- A 4-year cycle for SASS would also allow the possibility of administering SASS and the National Assessment of Educational Progress (NAEP) student assessment at the same time in some of the same schools (Skaggs and Kaufman in press). A SASS-NAEP linkage is being conducted as a research and development project in 1999–2000 to enrich the database for research. If the linkage is successful and the results prove useful, a similar linkage may be sought in future rounds of SASS. A 4-year cycle for SASS would allow the possibility for NAEP and SASS to be synchronized again in 2003–04.

Quality of SASS Data

The main sources of potential error for SASS are sampling error, coverage error, nonresponse, and measurement error. The following discussion reviews these potential error sources in order to identify areas for methodological improvement and for further methodological study.

Sampling error

Each of the individual surveys in SASS is designed to produce certain key estimates—often for many different domains—with specified levels of precision. Sample sizes are chosen to satisfy these precision requirements. Given this situation, a key issue with regard to sampling error is the efficiency of the sample design.

The assessment of sampling efficiency is complex because all the component surveys are interrelated, with the School Survey serving as the sampling frame for the other surveys. There are two advantages of the interrelated sample design: first, data from the different surveys can be linked for analysis (for example, data from the principal and teachers in the same school can be analyzed together); and, second, there are some cost savings in sample selection. However, the interrelated design places a high response burden on sampled schools, which may harm response rates, and it involves compromises in sample design.

Compromises in the current sample design. Because the sample of schools selected for the School Survey is the starting point for the samples for all the other surveys, its design places constraints on the sample designs for the other surveys. The sample design for the School Survey is a compromise design that takes account of the needs of both that survey and the Teacher Survey. Schools are sampled with probability proportional to a measure of size that is the square root of the number of teachers, as a compromise between equal probability, which would be appropriate for the School Survey, and probability proportional to the number of teachers, which would be appropriate for the Teacher Survey.

Use of the square root of the number of teachers as a compromise measure of size also has implications for the other SASS components. For example, sampling schools with equal probability would be more appropriate for the Principal, Library, and Librarian Surveys, whereas sampling with probability proportional to the number of teachers (which may be roughly proportional to the number of students) may be more suitable for the Student Records Survey.

The choice of a measure of size for sampling schools is related to the form of the estimates to be produced. Thus, an equal probability sample of schools is appropriate for the School, Principal, Library, and Librarian Surveys if the estimates produced are expressed in terms of numbers or percents of schools, principals, libraries, or librarians with given characteristics. However, it is often more relevant to express the estimates in terms of numbers or percents of students. In discussing this issue, Kish (1965, p. 418) gives the example that, around 1957, one-half of American high schools offered no physics, but that these schools accounted for only 2 percent of high school students. For most purposes, the 2 percent figure is the more meaningful one. An efficient design for student-based estimates would sample schools with probability proportional to the number of students, as distinct from the equal probability sampling that is appropriate for school-, principal-, library-, or librarian-based estimates.

Another example of compromise in sample design relates to the sample allocation used in the School Survey to provide domain estimates of specified precision. The smaller Library, Librarian, and Student Records Surveys are not designed to provide all these domain estimates, and therefore they subsample in a manner that attempts to redress the unequal allocation of the sample across domains. However, this subsampling cannot fully compensate for the domain oversampling.

Evaluation of the sample design. No extensive evaluation of the interrelated sample design for the surveys in SASS has

been conducted. Since SASS is itself evolving and since circumstances are changing, a broad-ranging review of the interrelated design would be advisable periodically. Such a review could determine whether all the survey components should remain interrelated as at present or whether some of the surveys should be conducted separately.

Assuming that the interrelated design is retained, research could usefully be conducted based on data collected in the first four rounds to determine whether any improvements in sampling efficiency can be obtained. For example, early research led to the decision to sample schools first and then select the local education agencies (LEAs) of sampled schools. This decision could be reviewed using the data now available. The suitability of the current measure of size for sampling schools could also be assessed. A full review of the SASS interrelated sample design would be a complex undertaking since many design choices affect different survey components in different ways, but even some limited evaluations may lead to useful gains in sampling efficiency.

Coverage error

The ideal sampling frame for a survey would include every element in the survey's target population with a single listing for each element. In practice, this ideal is rarely achieved, and there is clear evidence that it is not achieved in the component surveys of SASS.

Sampling frames. The issue of school coverage is particularly important in SASS because of the nested structure of the surveys. In recent rounds, the Common Core of Data (CCD), supplemented by lists of schools from the Bureau of Indian Affairs (BIA) and the Department of Defense (DOD), has served as the sampling frame for public schools, and the Private School Survey (PSS), supplemented by updated lists of affiliation members, has been used for private schools. In round 4, an additional frame has been included for charter schools. Since the CCD and PSS are used for several NCES surveys, their coverage is the subject of broad interest. Several recent studies have evaluated their coverage, and continuous efforts will be made to improve them.

An issue of concern to SASS is that inevitably the universe frames are out of date for the school year of the SASS surveys (e.g., the public school sample for round 3 was selected from the CCD for school year 1991–92, whereas the reference period for that round of SASS was school year 1993–94). As a result, new schools and recent school splits and mergers are not reflected on the frames. It would be useful to determine the magnitude of the coverage problem from this source and also to evaluate the quality of the list of charter schools.

Definitional usage. A significant problem with coverage is that a survey's definition of the units to be covered may not conform to the structure and terminology used in different parts of the population. Thus, for example, some states consider certain administrative groups of schools to be single schools, whereas SASS defines each individual administrative unit to be a school. This kind of problem affects both the frame listings and the data reported for a sampled "school." The definitional problem arises particularly with students and teachers, since the sampled schools provide the listings of these individuals. It is a particularly severe problem in the teacher listing operation, since defining who is to be included as a teacher is not straightforward. In this situation, there is the risk that the person completing the form will use the school terminology for a teacher rather than the SASS definition.

Teacher Survey procedures. A particular concern with coverage in the Teacher Survey relates to the operational procedures that define the sample, since schools are asked to provide the listings of their teachers about 2 or 3 months before the Teacher Survey questionnaires are mailed out. Teachers who are sampled from the teacher listing forms but have left the school by the time of the Teacher Survey data collection are treated as out of scope, while teachers joining the school in the interim have no chance of selection. Thus, the survey's coverage is neither teachers at the beginning of the school year nor teachers at the time of data collection. No study of teacher mobility within a school year has been conducted to date to assess the magnitude of the problem.

Self-classification as out of scope. Additional noncoverage problems may also occur in the School Principal, Library, and Librarian Surveys, where some schools classify themselves as out of scope (having no principal, library, or librarian). A study to determine the extent of self-classification errors would be useful.

Nonresponse

Rates of response to the surveys. The response rates to the various SASS surveys have generally been high for public schools. For example, in round 3 the public school response rates for all the surveys that were conducted in a single phase of data collection were over 90 percent. The Teacher Survey and the Student Records Survey had lower response rates, at just over 80 percent, as a result of two opportunities

for nonresponse. In the Teacher Survey, nonresponse could have occurred either because the school did not provide the teacher list for sampling teachers or because a sampled teacher failed to respond. In the Student Records Survey, nonresponse could have occurred either because a school did not provide a teacher list and class rosters for sampled teachers or because the school failed to return the completed questionnaires for sampled students. The lowest public school response rate has been that for the TFS. Although a high proportion of teachers responding to the Teacher Survey respond also to the TFS, the additional phase of data collection leads to some further losses that resulted in an overall response rate of 77 percent for round 3.

For private schools, the response rates for all the surveys in SASS have been markedly lower than those for public schools. In round 3, only the School and Principal Surveys had response rates of over 80 percent. The response rates for the other surveys were 70 percent or somewhat higher, except for the TFS, where the overall response rate was only 64 percent.

As with any repeated survey, continuing attention needs to be given in SASS to maintaining and, if possible, increasing response rates. Experimental studies could usefully be conducted to test out methods to improve response rates, particularly for the private school components of SASS. A range of possible methods could be considered, including the use of endorsements by different sponsor-organizations targeted at different types of schools, the use of incentives, and the use of shorter questionnaires that are easier to complete.

To achieve its final response rates, SASS employs a combination of mail questionnaires followed by telephone interviews with mail nonrespondents and field follow-up, if necessary. The per-unit cost for telephone data collection is much higher than for mail data collection. Also, there are indications that mail responses are of higher quality than telephone responses (although this is based on nonexperimental data). For both these reasons, it is desirable to maximize the mail response rates. Using postcard reminder cards and allowing a longer interval for mail returns in round 3 may have contributed to higher mail response rates in that round. Continued efforts to improve the user-friendly format of the questionnaires and the accompanying material may also help to increase mail response rates.

Rates of response to individual items. Item nonresponse rates vary greatly. Many items have high response rates, but there are others with low response rates. Some low response rates are likely to result from the difficulty or, in a few cases, the sensitivity of the information requested. Others appear to be caused by respondents' failure to navigate correctly through a questionnaire's skip instructions. It may be possible to reduce some of those problems by revising the content and wording of questions and by changing the format and layout of the questionnaires.

Recent research on the design of self-completion questionnaires deals with the principles of design for navigating the respondent through the questionnaire, as well as more generally for obtaining responses of high quality. In addition, advances in printing methods facilitate the use of tools—such as color, shading, and different font sizes—that increase the available design options. Attention to ensuring that the SASS questionnaires are as user-friendly as possible not only addresses the item nonresponse problem. It may also reduce total nonresponse, obtain more valid responses, and reduce the number of changes made in editing.

Measurement error

A variety of methods have been used to investigate measurement errors in SASS, including reinterviews, a record check study, in-depth interviews using cognitive research techniques, methodological experiments, reviews of completed questionnaires, analysis of errors and inconsistencies detected during data processing, and aggregate comparisons of survey estimates with estimates from external sources (which deal with all types of error in combination). A variety of methods are needed since all methods have their limitations.

Reinterviews. The reinterview program is a core component of the measurement error research in SASS, being applied in most of the surveys at each round. This program has been valuable in identifying items with high response variance, and many of these items have been revised in later rounds in an attempt to reduce the response variance. However, reinterviews have two main limitations. First, they measure only inconsistency of response, and thus fail to identify cases where a respondent consistently gives a wrong answer. Second, by themselves, reinterviews fail to indicate the reasons for inconsistency.

A common finding from the reinterview program across all the SASS surveys has been the low level of reliability for opinion questions. This finding is consistent with the results for opinion questions in other surveys. Such unreliability may be acceptable for some limited forms of analysis, but is problematic for more detailed analysis. For

the latter type of analysis it may be necessary to improve the reliability with which a construct is measured by creating an index from the responses to several questions relating to that construct.

Record check studies. Record check studies are often valuable for examining measurement errors, but they also have their limitations. Most importantly, they can be used only when the relevant information is available on records and access can be obtained. Even when this is the case, there remain problems of erroneous matches and failures to match, incorrect information on the records, and differences between the definitions of the variable for the records and for the survey. For these various reasons, the only record check study conducted in SASS to date has been the teacher transcript record check study.

In-depth interviews. The attraction of a record check study is that it seeks to determine "true values" with which the survey responses can be compared (subject to the limitations indicated above). Another approach for obtaining true values is to conduct in-depth follow-up interviews for a subset of key items—such as number of full-time-equivalent (FTE) teachers in the school—with extensive questioning and encouragement to respondents to consult records. Not only can this approach give true values (with some error), it can also sometimes identify the sources of error (e.g., counting a part-time teacher as a full-time teacher). This approach may be useful in a future pilot study and/or a future round of SASS.

Comparisons with other sources. Comparisons of SASS estimates with estimates from other sources provide an overall evaluation of the SASS estimates. However, the opportunities for such comparisons are very limited, and even when they can be made, they tend to be of limited value. Any differences observed may reflect definitional differences, differences in the time reference, errors in the other sources, or errors in SASS arising from any combination of noncoverage, nonresponse, sampling, measurement, or processing. As a result, the aggregate comparisons that have been made in rounds 1 to 3 of SASS have been useful in drawing attention to some major discrepancies, but have generally not been able to identify the causes of the discrepancies. An extension of the aggregate comparison approach is to perform micro-level matching of SASS responses and similar data in record sources. This type of match may provide an understanding of the discrepancies and, hence, indicate whether changes should be made in SASS. For example, such a match conducted at the school level to compare SASS and CCD data on the numbers of FTE teachers found that schools often appeared to report headcounts, rather than FTE counts. Application of micro-level matches in other areas could prove equally useful.

Concluding Remarks

This report reviews a variety of error sources, providing quantitative measures of error where possible. However, in general, the effects that an error source may have on a survey estimate cannot be easily quantified. For instance, the lower the response rate, the greater the likelihood of a significant nonresponse bias, even after nonresponse adjustments have been made, but the magnitude of the bias in a particular estimate is unknown. Furthermore, it has not been feasible to combine all the indications of quality into an overall index of total survey error for a given survey estimate. Nevertheless, the information on quality presented in the report should help users to decide how much confidence to place in the estimates of interest to them and to determine how best to use the survey data in their analyses.

The report also suggests a number of possible research projects that may guide future methodological developments using the current approach to data collection. In a broader context, SASS will also need to keep in touch with technological advances in communications. In particular, the rapid advances taking place in the use of the Internet suggest that by round 5 or 6 of SASS the preferred mode of data collection may shift from a mail questionnaire to a Web-based questionnaire for several of the surveys. A number of special research studies will be needed to develop the new methods before such a change can be implemented in SASS data collection operations.

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Data sources: The NCES Schools and Staffing Survey (SASS), 1987–88, 1990–91, and 1993–94; and Teacher Follow-up Survey (TFS), 1988–89, 1991–92, and 1994–95.

For technical information, see the complete report:

Kalton G., Winglee, M., Krawchuk, S., and Levine D. (2000). *Quality Profile for SASS Rounds 1–3: 1987–1995* (NCES 2000–308).

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To obtain the complete report (NCES 2000–308), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site *(http://nces.ed.gov)*.

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How Does NAEP Select Schools and Students?

Alan Vanneman and Sheida White

This article was originally published as an issue of Focus on NAEP. The Focus on NAEP series briefly summarizes information about the ongoing development and implementation of the National Assessment of Educational Progress (NAEP).

Introduction

The National Assessment of Educational Progress (NAEP), the nation's report card, is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. Since 1969, assessments have been conducted periodically in reading, mathematics, science, writing, history, geography, and other fields. Only information related to academic achievement is collected under this program. NAEP guarantees the privacy of individual students and their families.

The National Center for Education Statistics (NCES), an agency within the U.S. Department of Education, asks thousands of schools and students to participate in NAEP. Their participation in NAEP allows NCES to provide accurate information for the nation as a whole on how our students are performing in a variety of academic subjects.

In addition, NCES uses NAEP data to compare the performance of students in individual states against the national average and against students in other states. No other assessment can do this. NCES also uses NAEP data to make comparisons of student performance over time, both nationally and at the state level. These comparisons can be made for student subgroups—for males and females, for example, and for blacks, whites, Hispanics, Asians, and American Indians—as long as the subgroups are well represented in the sample.

Although NCES releases several major NAEP reports every year, most people are not familiar with NAEP. The national press usually refers to NAEP reports as "a national study" or "a federal report," coming from "the federal government" or "the U.S. Department of Education," without identifying NAEP as the source. Because people do not know what NAEP is or what it does, they can be skeptical about why they should participate in NAEP. In fact, NAEP is a unique source of information on education in America, information that policymakers and the general public need if they are to make informed decisions about education in America.

How Did I or My School Get Selected for a NAEP Assessment?

NCES uses a multistage sampling method to select the schools and students who will participate in a given NAEP assessment (figure 1). This method allows NCES to give an accurate picture of student performance, while keeping the burden on students and schools to a minimum. For example, a NAEP national assessment in reading will require the participation of about 8,000 fourth-grade students (out of a population of approximately 3.5 million). Yet this assessment will provide data that are used to estimate the reading performance of all 3.5 million students, and also for subgroups—Hispanic fourth-graders, for example, who constitute only 11 percent of the fourth-grade population.

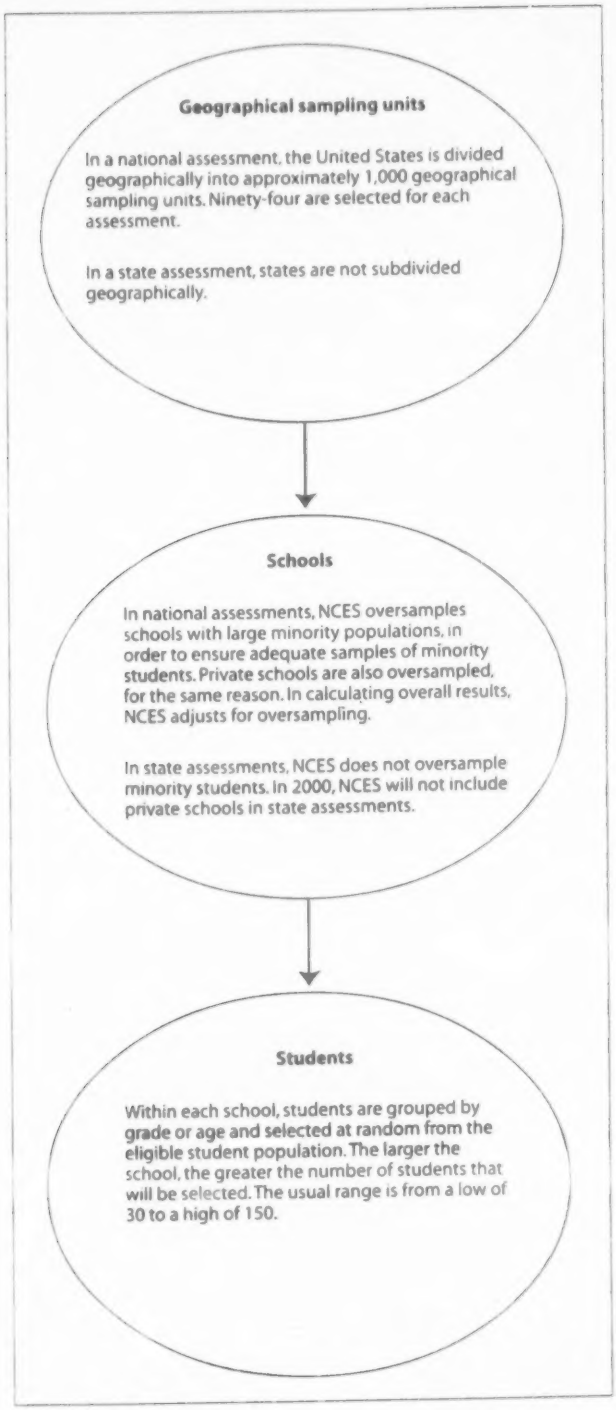
National assessments

For its national assessments, NCES begins by dividing the country into about 1,000 geographical sampling units, varying in population from several million to 45,000 (figure 1). The larger a sampling unit is, the greater its chance of being selected. In fact, the 22 largest sampling units—the nation's largest metropolitan areas—are always selected. The remainder are arranged in 72 categories, defined by such factors as geographical location, minority population, education level, and income level. By selecting one sampling unit from each category, NCES will obtain a representative student sample for the nation.

Within a sampling unit, NCES arranges schools in categories similar to the categories used in the selection of sampling units themselves. NCES deliberately oversamples private schools and schools with high minority populations. Oversampling allows NCES to obtain accurate information on the performance of minority and private school students.[1]

[1] In calculating the average performance of all students, NCES adjusts for the fact that certain groups were oversampled.

Figure 1.—NAEP sampling procedures


Geographical sampling units
In a national assessment, the United States is divided geographically into approximately 1,000 geographical sampling units. Ninety-four are selected for each assessment.
In a state assessment, states are not subdivided geographically.
Schools
In national assessments, NCES oversamples schools with large minority populations, in order to ensure adequate samples of minority students. Private schools are also oversampled, for the same reason. In calculating overall results, NCES adjusts for oversampling.
In state assessments, NCES does not oversample minority students. In 2000, NCES will not include private schools in state assessments.
Students
Within each school, students are grouped by grade or age and selected at random from the eligible student population. The larger the school, the greater the number of students that will be selected. The usual range is from a low of 30 to a high of 150.

State assessments

NAEP national and state assessments are done separately. States participate in NAEP state assessments on a voluntary basis. An increasing number of states, after deciding to participate in a NAEP state assessment, are requiring schools to participate in the assessment.

In a NAEP state assessment the state is not divided into geographical sampling units. The entire state is treated as a sampling unit, and the schools are arranged in categories in the same manner as in a national assessment.

At the state level, NCES does not oversample schools with a large number of minority students, although a state may augment its sample to obtain greater representation of subpopulations if it wishes. In the past, NCES collected data at the state level for private school students, but in most states the sample for these students was too small to be useful. In 2000, NCES will not include private schools in state assessments.

After consulting with organizations of private schools, NCES will test a new approach to collecting private school data nationally in 2000.[2]

Selection of students

Once a school has been selected for either a state or national assessment, students within the school are classified by grade (4th, 8th, or 12th) and then selected at random.[3] The number of students assessed in a school for a single assessment will usually range from about 30 to 150. The number of students assessed in a school is directly dependent on the size of the school and the type of assessment. The larger the school, the greater the number of students assessed.

Students are selected from the entire eligible student population. For example, if there are three 4th-grade classrooms in a school, students are likely to be selected from all three classrooms. This avoids the bias that might result from taking students from only one of several classrooms. Bias could arise from any number of factors—the use of ability tracking by a school, for example, or the efforts of an exceptional teacher.

Schools are frequently selected for more than one assessment. For example, in 2000, NAEP will be conducting assessments in mathematics, science, and reading. Because each assessment has different materials, instructions, and time periods, each assessment is administered in a separate session, even if several assessments are being administered in the same school on the same day.

Why Should I Participate in NAEP?

High participation rates help ensure the quality of NAEP. If schools or students selected to participate in NAEP decline to do so in large quantities, this affects the validity of NAEP data. Overall, over 80 percent of schools, and 85–95 percent of students, selected to participate in NAEP do participate. NCES cannot report data from a participating state if less than 70 percent of the initially selected schools agree to participate, and this has happened on occasion.

When a school declines to participate, the possibility exists that the school was somehow different from those schools that agreed to participate, and thus that the actual sample is not representative of the population as a whole. For example, low-performing schools might be more likely to decline than middle- and high-performing schools. Because there is no survey information available on a nonparticipating school, NCES cannot determine whether or not the school was in fact different. The greater the number of nonparticipating schools, the greater the possibility that the sample is not representative. Nonparticipation of individual students has a smaller but similar effect.

Can Schools or Students Volunteer to Participate in NAEP?

NCES cannot accept either schools or students as voluntary participants in NAEP. The sampling techniques that NCES uses in NAEP allow NCES to produce detailed results on student performance, while using only a small sample and usually requiring no more than an hour and a half of a student's time for administration of the assessment. The validity of these results depends on the ability of NCES to know the probability of selection at every stage of the process, from geographical sampling unit to school to student. Certain types of schools or students may be more likely to volunteer for NAEP, and these differences could be related to performance. For example, higher performing schools or individuals might be more likely to volunteer. Inclusion of such schools or students could result in a sample that was not representative of the whole population. For this reason, NCES cannot accept schools or students not in the sample that volunteer to participate in NAEP.

[2] In the past, NCES published results for private school students as a whole, and separately for Catholic and "other" private schools. In the national assessments conducted in 2000, with the oversampling of private schools, NCES will publish data on Catholic, Lutheran, Conservative Christian, "other religious," "other nonsectarian," and schools that are members of the National Association of Independent Schools.

[3] Most NAEP assessments assess students by grade, but some assess them by age (9, 13, or 17).

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Conclusion

For the past 30 years, NAEP has provided policymakers, educators, and the general public with valuable information on the academic performance of students in American schools. This is achieved at minimal burden for schools and students through the sampling and assessment techniques developed and employed by NCES.

Participating in NAEP does require a commitment of time and effort by schools and students. This willingness to participate makes it possible for NCES to provide the nation and the states with unique data on student performance. If all schools and students selected to participate in NAEP do participate, the accuracy and timeliness of the NAEP data are enhanced. High participation rates in NAEP allow Americans to make informed decisions about education and education policy using the best possible data.

For technical information, see

Calderone, J., King, L.M., and Horkay, N. (1997). *The NAEP Guide: A Description of the Content and Methods of the 1997 and 1998 Assessments* (NCES 97-990).

Author affiliations: A. Vanneman, Education Statistics Services Institute (ESSI); S. White, NCES.

For questions about content, contact Sheida White *(sheida_white@ed.gov).*

To obtain this* Focus on NAEP *(NCES 2000-459), call the toll-free ED Pubs number (877-433-7827) or visit the NCES Web Site *(http://nces.ed.gov).*

How Does NAEP Ensure Consistency in Scoring?

Sheida White, Connie Smith, and Alan Vanneman

This article was originally published as an issue of Focus on NAEP. The Focus on NAEP series briefly summarizes information about the ongoing development and implementation of the National Assessment of Educational Progress (NAEP).

Introduction

The National Center for Education Statistics (NCES) has been conducting the National Assessment of Educational Progress (NAEP) since 1969. In addition to regular assessments in reading, mathematics, science, and writing, NCES also conducts assessments in such subjects as geography, U.S. history, civics, and the arts.

All of these assessments include constructed-response questions in addition to multiple-choice items. Many include "short constructed-response" questions, which require students to provide a numerical response or write a few words or sentences, as well as "extended constructed-response" questions, which may require students to write a paragraph or more, perform a science experiment and write a description of what was done, or solve a word problem in mathematics, providing a written explanation of the answer. Writing assessments require students to produce two extensive writing samples, while the arts assessments require students to create and perform art.

Extended constructed-response questions for NAEP assessments such as reading, U.S. history, geography, and civics are scored according to four-level scoring guides. Four-point answers are typically scored as "incorrect," "partial," "essential," or "fully correct," with "incorrect" answers receiving only one point and "fully correct" answers receiving the full four points. However, some assessments, such as the arts, mathematics, and writing assessments, have questions that recognize five or even six levels of performance.

Each national assessment generates thousands of student responses that must be scored individually, and combined state/national assessments can generate almost five million responses.[1] NCES and its contractors have developed a large number of special techniques to ensure that these constructed-response questions can be scored consistently. This *Focus on NAEP* discusses the techniques used to score written assessments such as reading, mathematics, writing, and science. A separate *Focus on NAEP* will cover the special problems encountered in assessing the arts.

[1]The NAEP 1997 national arts assessment (in music, theatre, and the visual arts) covered the 8th grade only, and involved a total of about 6,500 students. The arts assessment involved relatively few questions, because students devoted much of their time to a single creating or performing task. A national/state assessment in a subject such as science will involve about 7,500 students at each of three grades (4th, 8th, and 12th) at the national level, plus about 2,500 students per grade for participating states. In the past, more than 40 states and other jurisdictions have participated in each NAEP state assessment.

Selecting Scorers

In the year 2000, NCES will conduct two national/state assessments, in mathematics and science, at grades 4, 8, and 12 at the national level and at grades 4 and 8 at the state level. In addition, there will be a national reading assessment for grade 4 only. The three assessments will generate close to 10 million constructed responses. The scoring will be done, as it has been done for previous assessments, by National Computer Systems (NCS). Educational Testing Service (ETS) develops the scoring guides for the questions and provides training in their use.

Scoring will be done at two online Professional Scoring Centers, one in Iowa City and the other in Tucson, Arizona. The contractors will hire about 150 scorers for the mathematics assessment, about 175 for the science, and about 50 for the reading.

Scorers selected for the assessment will have the following qualifications:

- a minimum of a bachelor's degree in the appropriate academic discipline (mathematics, science, or English), or in education;
- scoring experience in NAEP or non-NAEP assessments preferred; and
- teaching experience at the elementary or secondary level preferred.

The 2000 Mathematics Assessment will have bilingual (Spanish/English) booklets for the 4th and 8th grades. Scorers fluent in Spanish will be hired for the scoring of booklets answered in that language.

Training Scorers

Training scorers to score short and extended constructed-response questions consistently is one of the most

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important parts of the entire scoring procedure. There is separate training for each constructed-response question.[2]

Training involves the following:

- presenting and discussing the question to be scored and the question's rationale;
- explaining the scoring guide to the team and discussing the "Anchor Packet," which contains the scoring guide, the question, its scoring rationale, and the "Anchor Set" of student responses that represent the various score points in the guide;
- discussing the rationale behind the guide, focusing on the criteria that differentiate the levels in the guide;
- practicing scoring on a "Practice Set" of students' answers; and
- continuing to practice until a consensus is reached on how to apply the scoring guide.

Preparing training materials for a question

Trainers and participating experts in the field begin by selecting from 150 to 300 student answers to an extended constructed-response question. They score them all, for training purposes, and use the answers to create three different training sets: the Anchor Set, the Practice Set, and the Qualification Set.

Answers in the Anchor Set have the scores written on them. An Anchor Set contains at least three answers for every score point in a question. The Anchor Set for a three-point question will usually have 10 answers, and the Anchor Set for a four-point question will have about 15. The trainers also score a Practice Set of about 10 to 20 answers, and a Qualification Set of similar size, but do not put the scores on the answers.

Training to score a question

Scorers, divided into training teams, will first study the scoring guide developed for a given question. Then they receive the Anchor Set of answers, which they review in conjunction with the scoring guide. Then they are given the Practice Set. Scorers score each of the answers, and then are given the "true" score, arrived at earlier by the trainers, for comparison and discussion.

Qualifying to score a question

Once the scorers are familiar with the scoring of a question, they are given a Qualification Set of answers to score. At least 80 percent of their scores must match the scores given by the trainers. Scorers who fail to get 80 percent discuss the scoring of the Qualification Set with their trainer and then are given a second Qualification Set. If they fail to get at least an 80 percent match on this set, they cannot score the question.

Image Scoring and Monitoring

Scoring of constructed-response questions is done by an "Image" process. While student answers are written in traditional answer booklets, for scoring purposes they are converted into computer images. This allows all the answers for a given question to be grouped together and scored at the same time. Scorers are trained to score the answers to a question, and then work exclusively on answers to that question until each one has been scored.

When scorers begin scoring answers to a question, they first take turns scoring the same question, comparing answers, or score in pairs as a final quality check before scoring on their own. They receive retraining at the beginning of each day and after any break that exceeds 15 minutes.

Scorers will be monitored by supervisors (known as "table leaders") in a variety of ways. A certain percentage of answers for constructed-response questions will be scored twice.[3] The second scorer will not know the score assigned by the first scorer. Because all scoring is done on a linked computer network, table leaders will have data on the scoring agreement rates for all scorers while the scoring is in progress. Figure 1 provides a "reliability summary" used to keep track of scoring consistency.

A minimum standard agreement rate will be set for each question, which will take into account both the number of score points for a question and the subject being assessed. For example, a higher agreement rate is set for a three-point question than a four-point question; and agreement rates will be higher for a subject such as mathematics, where the "correct" answer can usually be defined with greater precision, than for a subject such as reading. In 1998, the average standard agreement rate for questions on the

[2]The training procedures described are for extended constructed-response questions. The procedures for short constructed-response questions are similar but less elaborate.

[3]Six percent of the answers for the constructed-response questions of the mathematics and science assessments for grades 4 and 8 will be scored twice. This will include both the national and state assessments for these subjects and grades. In addition, 25 percent of the answers for the grade 12 assessments in science and mathematics will be scored twice, a procedure that will also be followed for the reading assessment (grade 4 only). A larger percentage will be scored for these assessments because they are national assessments only, and thus will involve substantially fewer answers.

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Figure 1.—Scorer reliability summary

First Scorer	Blank		1		2		3		4		Illegible		Off task	
Second Scorer	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Blank	115	100%												
1			18	90%	2	10%								
2			2	1%	330	95%	17	5%						
3					7	4%	156	92%	6	4%				
4							3	13%	21	88%				
Illegible														
Off task													1	100%

Total times 2nd read: 678 Percent agreement: 94.5%

This sample "Scorer reliability summary" shows how table leaders at National Computer Systems keep track of the scoring consistency of the second scoring of a single NAEP extended constructed-response question.

The sample summary is for a four-point question, whose answers are scored as either "incorrect," "partial," "essential," or "fully correct"—with "fully correct" answers receiving the full four points. (The rows and columns marked "Blank," "Illegible," and "Off task" are for answers that are unscorable due to omission, completely illegible handwriting, and unresponsiveness to task.)

This summary shows the cumulative agreement rate for all second scoring of students' answers to a single four-point question. Scoring decisions by the first scorer head the double columns at the top of the chart, while those for the second scorer, appearing in the far left-hand column, govern the rows. The chart should be read row by row. (The "3" row has been bolded for illustration.)

The cells created by the intersection of the "3" row and the double columns labeled "2," "3," and "4" give information on answers that received a "3" score from the second scorer. The first "n" or "number" cell shows that 7 answers scored as "3" by the second scorer received a score of "2" from the first scorer. The first "%" cell indicates that these 7 answers constitute 4% of the answers scored as "3" by the second scorer.

The next two cells to the right indicate that 156 answers, or 92% of all the answers receiving a "3" score from the second scorer, received a "3" from the first scorer as well. The next two cells indicate that 6 answers (4%) received a "3" from the second scorer and a "4" from the first scorer.

Ideally, all numbers and percentages would be in the shaded cells, and all percentages would be 100%. In fact, however, this only occurs for the "Blank" and "Off task" answers. The "Percent agreement" of 94.5% seen in the lower right-hand corner is obtained by dividing the total number of "agreed" scores (641) by the total number of scores (678).

reading assessment was 91 percent for grade 4, 90 percent for grade 8, and 89 percent for grade 12. For the 1996 mathematics assessment, it was 96 percent for all three grades.

If the minimum agreement rate is not met for a question, a number of different remedial actions may be necessary. If all or most members of a scoring team appear to be below the average, retraining may be appropriate. If there seems to be a problem with one scorer, the scorer may be reassigned.

The answers that were scored with insufficient agreement rates need to be rescored. This may be done by a group of supervisors, or all the scores for a question may be erased, and the team starts over again. Sometimes, the question is assigned to a different scoring team.

Occasionally, the scoring trainer may decide that the scoring guide needs to be refined, although this rarely happens during an assessment. Scoring guides are more likely to be refined during preliminary testing of assessment questions.

Table leaders will have methods to review an individual scorer's consistency as well as the consistency of a scoring team. A table leader will typically review 10 percent of the answers scored by a scorer and will discuss with the scorer any score that appears inappropriate. A table leader has the authority to rescore any answer, although this does not affect the inter-rater reliability data. To check on scoring consistency across individual scorers, a table leader can also review all the answers that were given a particular score by a scoring team or the committee that developed the assessment questions.

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The NAEP assessments that NCES will be conducting in 2000 are periodically redesigned to keep them responsive to changes in curricula and also to reflect improvements in assessment techniques. However, because NCES uses the same assessment instrument several times before making changes, these assessments usually offer some trend data. For this reason, decisions by scorers working on the current assessments will be compared with decisions by past scorers when appropriate. A similar procedure is used for the NAEP long-term trend assessments, whose primary function is to track student performance over time.

Conclusion

Achieving consistency in the scoring of constructed-response questions begins with the selection of individuals who have a background in education and experience in scoring. These individuals are trained carefully in the scoring of each question, so that all the scorers, working independently, will almost always give the same number of points to any answer to a given question. Regular second scoring of answers to every question ensures that this consistency is maintained throughout the scoring process.

For technical information, see

Allen, N.L., Carlson, J.E., and Zelenak, C.A. (forthcoming). *The NAEP 1996 Technical Report.*

Allen, N.L., Swinton, S.S., Isham, S.P., and Zelenak, C.A. (1998). *Technical Report of the NAEP 1996 State Assessment Program in Science* (NCES 98–480).

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To obtain this Focus on NAEP (NCES 2000–490), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site (*http://nces.ed.gov*).

Data Products, Other Publications, Funding Opportunities, and Errata

Data Products

Data File: High School & Beyond Sophomore Cohort: 1980–92 Postsecondary Education Transcripts and Supplement, Restricted Data CD-ROM 99

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Data Products

Data File: High School & Beyond Sophomore Cohort: 1980–92 Postsecondary Education Transcripts and Supplement, Restricted Data CD-ROM

To obtain this CD-ROM, you must be licensed to use restricted data from the High School and Beyond (HS&B) Longitudinal Study. This CD contains the second revision of the restricted data for the 1993 "Postsecondary Education Transcript Study" of the HS&B sophomore cohort (HS&B-So:PETS), along with new derived variables for the sophomore cohort surveys (HS&B-So:1980/1992). Included are approximately 300 new derived variables that were not in the previous edition of the CD, revisions of some variables that were in the previous edition, and new weights. New edits and variables are described on the CD, as are ways of dealing with cases in which new and old versions of the same variable appear in the data set. The CD includes the new Electronic Codebook for Windows (ECBW) software for accessing the data in Windows 95/98.

In order to protect the confidentiality of respondents, some of the data on this CD are not displayed in the

Public-Use Data Analysis System (DAS, available online at *http://nces.ed.gov/das/*). By providing access to complete raw data for HS&B-So:PETS, the CD permits licensed users to conduct analyses not available through the DAS. If your research requires the raw data, you must justify this need and go through formal procedures to obtain the appropriate restricted-use data license.

For questions about this CD-ROM (NCES 2000–194), contact Aurora D'Amico (*aurora_d'amico@ed.gov*).

For questions about restricted-use data licenses, contact Cynthia Barton (*cynthia_barton@ed.gov*).

Data File: BPS 96/'98 Restricted Data Electronic Codebook CD-ROM

Available only to those with the appropriate restricted-use data license, this CD-ROM contains complete raw data for the 1996 Beginning Postsecondary Students Longitudinal Study "First Follow-up" (BPS:1996/1998), as well as the Electronic Codebook for Windows (ECBW) software for using these data. The CD includes all data collected to date concerning those students who first began their postsecondary education in the 1995–96 academic year, were initially interviewed as part of the National Postsecondary Student Aid Study (NPSAS:1996), and completed a BPS follow-up interview in 1998. Included on the CD are data from institutional records, data from Department of Education financial aid records, entrance exam information, and data from the two student interviews.

In order to protect the confidentiality of respondents, the complete data do not appear in the Public-Use Data Analysis System (DAS, available online at *http://nces.ed.gov/das/*). By providing access to the complete raw data, this CD permits licensed users to conduct analyses not available through the DAS.

An analysis of the data from the first follow-up can be found in the BPS:1996/1998 descriptive report, *Descriptive Summary of 1995–96 Beginning Postsecondary Students: Three Years Later* (NCES 2000–154). The methodology report for NPSAS:1996 (NCES 98–073) and the methodology report for BPS:1996/1998 (NCES 2000–157) describe the base-year and first follow-up surveys. All three reports are available both on this CD and on the NCES Web Site (*http://nces.ed.gov*).

For questions about this CD-ROM (NCES 2000–156), contact Aurora D'Amico (*aurora_d'amico@ed.gov*).

For questions about restricted-use data licenses, contact Cynthia Barton (*cynthia_barton@ed.gov*).

Data File: Public Libraries Survey: Fiscal Year 1997

The Public Libraries Survey (PLS) is conducted annually by NCES through the Federal-State Cooperative System (FSCS) for Public Library Data. The data are collected by a network of state data coordinators appointed by the Chief Officers of State Library Agencies (COSLA). For fiscal year (FY) 1997, the PLS includes data from 8,968 public libraries in the 50 states, the District of Columbia, and the Northern Mariana Islands. Data collected include population of legal service area, staff, service outlets, library materials, operating income and expenditures, circulation, reference transactions, library visits, public service hours, circulation of children's materials, and electronic technology information.

Five database files, in Microsoft Access and ASCII format, were generated from the FY 97 PLS:

- Public Library Data File;
- Public Library State Summary/State Characteristics Data File;
- Public Library Outlet Data File;
- Administrative Entities Only/State Library Data File; and
- State Library Outlet Data File.

These database files and related documentation are available on the NCES Web Site.

For questions about this data product, contact P. Elaine Kroe (*patricia_kroe@ed.gov*).

To obtain this data product (NCES 2000–315), visit the NCES Web Site (*http://nces.ed.gov*).

Preliminary Data File: Public Libraries Survey: Fiscal Year 1998

The Public Libraries Survey (PLS)—conducted annually by NCES through the Federal-State Cooperative System (FSCS) for Public Library Data—collects descriptive data on public libraries and their outlets in the 50 states, the District of Columbia, and the outlying areas. The preliminary data file for fiscal year (FY) 1998 makes preliminary, but state-authorized, data available until the release of the final file and includes all state data submissions received to date. The preliminary file should be used with caution, however, as new state submissions and NCES editing may result in changes to the data.

The preliminary FY 98 data are available in a merged national file (in Microsoft Access and ASCII formats) and in individual state files (in ASCII format only). The data and related documentation can be downloaded from the NCES Web Site.

For questions about this data product, contact P. Elaine Kroe (*patricia_kroe@ed.gov*).

To obtain this data product (NCES 2000-371), visit the NCES Web Site (*http://nces.ed.gov*).

Preliminary Data File: State Library Agencies Survey: Fiscal Year 1999

The State Library Agencies (STLA) Survey—conducted annually by NCES as a cooperative effort with the Chief Officers of State Library Agencies (COSLA) and the U.S. National Commission on Libraries and Information Science (NCLIS)—collects descriptive information about state library agencies. The STLA Survey for fiscal year (FY) 1999 is the sixth in the series. The 421 items in the FY 99 survey include governance; public service hours; service outlets; collections; library service and development transactions; electronic services and information; allied operations; staff; income and expenditures; and services to public, academic, school, and special libraries as well as library systems.

The preliminary FY 99 data file makes preliminary, but state-authorized, data available until the release of the final file. Data for all 50 states and the District of Columbia are contained in the preliminary file. However, users are cautioned that the data have not been fully edited by NCES, and missing data are not imputed. (The final FY 99 file will contain imputations for missing data, unlike prior-year files.)

The preliminary data file is available in Microsoft Access and ASCII format. The data and related documentation can be downloaded from the NCES Web Site.

For questions about this data product, contact P. Elaine Kroe (*patricia_kroe@ed.gov*).

To obtain this data product (NCES 2000-372), visit the NCES Web Site (*http://nces.ed.gov*).

Other Publications

The NPEC Sourcebook on Assessment, Volumes 1 and 2

T. Dary Erwin

This two-volume sourcebook was produced by the National Postsecondary Education Cooperative (NPEC) to provide information on cognitive assessment as a way of examining the outcomes of postsecondary education. Specifically, the sourcebook focuses on methods of assessing postsecondary students in three skill areas: critical thinking, problem solving, and writing. The sourcebook is of particular interest to policymakers, accreditation agencies, and postsecondary institutions.

Volume 1: Definitions and Assessment Methods for Critical Thinking, Problem Solving, and Writing is a compendium of information about tests used to assess students in the three skill areas. It describes the various assessment methods currently available and discusses the conceptual and methodological criteria for selecting assessment methods for use in postsecondary education. An interactive version of this volume (*http://nces.ed.gov/npec/evaltests/*) allows users to specify their area(s) of interest and create a customized search of assessment measures within the three skill areas.

Volume 2: Selected Institutions Utilizing Assessment Results provides eight case studies of institutions that have addressed policy-related issues through the use

of the assessment methods presented in volume 1. Administrators, faculty, and others in postsecondary education can use volume 2 as a resource to learn about how these eight institutions are using student outcomes assessment methods for both internal and external policy-related purposes.

Author affiliation: T.D. Erwin, Center for Assessment and Research Studies, James Madison University.

For questions about this sourcebook, contact Nancy Borkow (*nancy_borkow@ed.gov*).

To obtain either volume 1 (NCES 2000–195) or volume 2 (NCES 2000–196), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site (*http://nces.ed.gov*), or contact GPO (202–512–1800).

SASS & PSS Questionnaires: 1999–2000

During school year 1999–2000, the NCES Schools and Staffing Survey (SASS) and Private School Survey (PSS) collected data on elementary and secondary schools, districts, principals, teachers, and school libraries. This publication presents the entire set of data collection instruments in one bound volume. An introductory overview explains the purpose, design, and data collection procedures for SASS and PSS. The set of questionnaires is designed to aid researchers who need to know the exact wording of the items and the context of particular items within a questionnaire. The individual questionnaires are also available online at *http://nces.ed.gov/surveys/sass* (under "Questionnaires and Items").

For questions about this publication, contact Kerry Gruber (*kerry_gruber@ed.gov*).

To obtain this publication (NCES 2000–310), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site (*http://nces.ed.gov*).

Highlights From the TIMSS Videotape Study

This 8-page brochure highlights key findings from the Third International Mathematics and Science Study (TIMSS) Videotape Classroom Study, an exploratory project that collected videotaped records of eighth-grade mathematics lessons in three countries: Germany, Japan, and the United States. Findings from this project provide rich contextual information that adds to our understanding of eighth-grade mathematics teaching and learning. The findings in this brochure are taken from the NCES report entitled *The TIMSS Videotape Classroom Study: Methods and Findings From an Exploratory Research Project on Eighth-Grade Mathematics Instruction in Germany, Japan, and the United States* (NCES 1999–074).

For questions about this brochure, contact Patrick Gonzales (*patrick_gonzales@ed.gov*).

To obtain this brochure (NCES 2000–094), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site (*http://nces.ed.gov*).

Developments in School Finance: 1998

William J. Fowler, Jr. (editor)

Developments in School Finance: 1998 is the fifth education finance publication from the annual NCES Summer Data Conference. Each year, state department of education policymakers, fiscal analysts, and fiscal data providers attend the conference for fiscal training sessions and presentations by invited experts on developments in the field of education finance. This publication contains seven of the papers presented at the July 1998 conference.

Each of the papers addresses the theme, "How to measure school performance in a tangible way." Individual papers explore the following specific topics: the limitations of measuring school productivity with only such concrete methods of assessment as test scores; comparisons between comparable school districts based on extant data; the issue of whether school voucher programs cream off the best students from public schools; the impact of shifting control of funding from the district level to the school level; the use of hierarchical linear modeling (HLM) in assessing fiscal equalization; the presentation of financial data in easily grasped graphic displays; and suggestions for enhancing the Early Childhood Longitudinal Study (ECLS) to allow the collection of additional financial data.

Editor affiliation: W. J. Fowler, Jr., NCES.

For questions about this publication, contact William J. Fowler, Jr. (*william_fowler@ed.gov*).

To obtain this publication (NCES 2000–302), *call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site (http://nces.ed.gov), or contact GPO (202–512–1800).*

Mini-Digest of Education Statistics: 1999

Alean Miller

The *Mini-Digest of Education Statistics: 1999* (the seventh edition) is a pocket-sized compilation of statistical information covering American education from kindergarten through graduate school. It is a convenient reference source for materials found in much greater detail in the *Digest of Education Statistics*, *The Condition of Education*, and *Youth Indicators*.

The *Mini-Digest* includes sections on elementary/secondary and postsecondary enrollment, teachers, educational outcomes, and finance. Each section contains short, easy-to-understand tables and figures along with text summaries. Current and past-year data are included, as well as projections for enrollment through 2009.

Author affiliation: A. Miller, NCES.

For questions about the Mini-Digest, contact Alean Miller (*alean_miller@ed.gov*).

To obtain the Mini-Digest (NCES 2000–036), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site (*http://nces.ed.gov*), or contact GPO (202–512–1800).

Directory of the 11th Federal Forecasters Conference: 2000

Debra E. Gerald (editor)

This directory is a publication of The Federal Forecasters Conference. The conference, a collaborative effort of forecasters from federal agencies in the U.S. government, provides a forum for sharing information on forecasting issues. One of the conference's objectives is to build a core network of forecasters whose cooperation furthers the use of forecasting as an important tool in the 21st century. The current directory lists forecasters from both federal agencies and the private sector as of August 2000.

Editor affiliation: D.E. Gerald, NCES.

For questions about this directory, contact Debra E. Gerald (*debra_gerald@ed.gov*).

To obtain this directory (NCES 2000–096), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site (*http://nces.ed.gov*), or contact GPO (202–512–1800).

Funding Opportunities

The AERA Grants Program

Jointly funded by the National Science Foundation (NSF), NCES, and the Office of Educational Research and Improvement (OERI), this training and research program is administered by the American Educational Research Association (AERA). The program has four major elements: a research grants program, a dissertation grants program, a fellows program, and a training institute. The program is intended to enhance the capability of the U.S. research community to use large-scale data sets, specifically those of the NSF and NCES, to conduct studies that are relevant to educational policy and practice, and to strengthen communications between the educational research community and government staff.

Applications for this program may be submitted at any time. The application review board meets three times per year.

For more information, contact Edith McArthur (*edith_mcarthur@ed.gov*) or visit the AERA Grants Program Web Site (*http://oera.ucsb.edu*).

The NAEP Secondary Analysis Grant Program

The NAEP Secondary Analysis Grant Program was developed to encourage educational researchers to conduct secondary analysis studies using data from the National Assessment of Educational Progress (NAEP) and the NAEP High School Transcript Studies. This program is open to all public or private organizations and consortia of organizations. The program is typically announced annually, in the late fall, in the *Federal Register*. Grants awarded under this program run from 12 to 18 months and awards range from $15,000 to $100,000.

For more information, contact Alex Sedlacek (*alex_sedlacek@ed.gov*).

Errata

Teacher Use of Computers and the Internet in Public Schools

This notice provides corrections to the Stats in Brief report *Teacher Use of Computers and the Internet in Public Schools*, which appeared in the Summer 2000 issue of the *Education Statistics Quarterly* (volume 2, issue 2). As published in that issue, the first column of table 2 contained incorrect data. In the table below, the erroneous data have been corrected.

To access the complete report (NCES 2000–090) with the corrected estimates, visit the NCES Web Site (http://nces.ed.gov).

Table 2.—Percent of teachers reporting using computers or the Internet for instruction and the percent assigning various uses to students to a moderate or large extent, by school and teacher characteristics: 1999

School and teacher characteristics	Teacher uses for classroom instruction	Teacher assigns to a moderate or large extent: Computer applications[1]	Practice drills	Research using the Internet	Solve problems and analyze data	Research using CD-ROM	Produce multimedia reports/ projects	Graphical presentations of materials	Demonstrations/ simulations	Correspond with others[2]
All public school teachers with access to computers or the Internet at school	**53**	**41**	**31**	**30**	**27**	**27**	**24**	**19**	**17**	**7**
School instructional level										
Elementary school	56	41	39	25	31	27	22	17	15	7
Secondary school	44	42	12	41	20	27	27	23	21	7
Percent of students in school eligible for free or reduced-price school lunch										
Less than 11 percent	61	55	26	39	25	32	29	26	22	7
11–30 percent	52	45	29	35	29	27	23	18	16	9
31–49 percent	53	39	33	29	26	30	23	16	17	11
50–70 percent	47	33	33	25	27	24	25	19	13	5
71 percent or more	50	31	35	18	27	19	22	19	16	8
Hours of professional development[3]										
0 hours	30	21	19	20	14	16	16	10	8	4
1–8 hours	46	36	26	28	24	24	20	16	13	7
9–32 hours	61	47	35	32	30	31	26	21	19	8
More than 32 hours	71	55	43	42	41	34	37	31	29	9

[1]Use computer applications such as word processing, spreadsheets, etc.

[2]Correspond with experts, authors, students from other schools, etc., via e-mail or Internet.

[3]Professional development in the use of computers or the Internet within the last 3 years.

NOTE: Less than 1 percent of all public school teachers reported no computers or Internet access were available to them anywhere in their school. These teachers were not included in the estimates presented in this table.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Public School Teachers Use of Computers and the Internet," FRSS 70, 1999.

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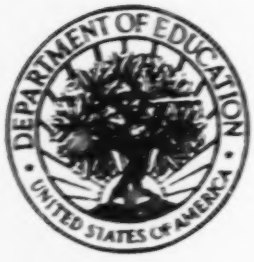
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